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CONTAMINATION ASSESSMENT REPORT FOR SITE 333 CSS PANAMA CITY FL
2/1/1997
BROWN AND ROOT ENVIRONMENTAL

REC'D FEB 24 1997

Contamination Assessment Report

for
Site 333

FILE

Coastal Systems Station
Panama City, Florida



Southern Division
Naval Facilities Engineering Command
Contract Number N62467-94-D-0888
Contract Task Order 0008

February 1997

**CONTAMINATION ASSESSMENT REPORT
FOR
SITE 333**

**COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA**

**COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**


**Submitted to:
Southern Division
Naval Facilities Engineering Command
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North Charleston, South Carolina 29406**

**Submitted by:
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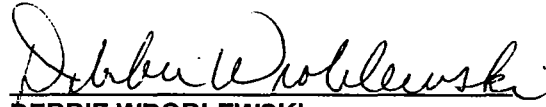
**CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0008**

FEBRUARY 1997

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EXECUTIVE SUMMARY

Brown & Root Environmental (B&R Environmental) has completed a Contamination Assessment (CA) at the Coastal Systems Station (CSS) Site 333 in accordance with the requirements of Chapter 62-770, Florida Administrative Code (FAC). The Contamination Assessment Report for Site 333 completed by B & R Environmental, January 1997, was submitted to the Florida Department of Environmental Protection (FDEP) for approval.

B&R Environmental performed the following tasks during the CA:

- Reviewed available Navy documents to identify potential sources and receptors for petroleum hydrocarbons in the vicinity, to evaluate private potable wells in a 0.25-mile radius and public supply water supply wells within 0.50-mile radius, and to locate nearby surface water bodies and determine surface hydrology;
- Reviewed soil and groundwater data collected during removal of the oil/water separator and waste oil tank to determine boring locations and monitoring well placements;
- Conducted site survey to identify utilities and to construct a site plan;
- Performed excavation of 16 soil borings for organic vapor analysis;
- Installed five shallow temporary groundwater monitoring points and collected groundwater samples for field screening with a portable gas chromatograph;
- Advanced four shallow permanent monitoring wells to approximately 13 feet below land surface (bls);
- Collected groundwater samples from the permanent monitoring wells for laboratory analysis for Gasoline and Kerosene Analytical Group parameters, including used oil parameter testing;

The results of the CA identified no "excessively contaminated" soil at the site, as defined by Chapter 62-770.200 FAC. Groundwater concentrations of total naphthalene, lead, vinyl chloride, phenanthrene, cis 1-2 dichloroethene, and Total Recoverable Petroleum Hydrocarbons (TRPH) were reported at concentrations above State Action Levels, however, these constituents were at levels which meet the criteria for Monitoring Only status. In an effort to further reduce these concentration levels to meet No Further Action status, the development of an Alternative Remedial Procedure for review and approval by the FDEP is recommended prior to developing and/or implementing a Monitoring Only Plan.

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

A Contamination Assessment (CA) has been conducted by Brown and Root Environmental (B&R Environmental) for the U.S. Navy (Navy) Southern Division Naval Facilities Engineering Command under Contract Task Order 0008, for the Comprehensive Long-term Environmental Action Navy (CLEAN III), Contract Number N62467-94-D-0888. The CA was conducted at Site 333 located at the Coastal Systems Station (CSS) in Panama City, Florida. The Florida Department of Environmental Protection (FDEP) Facility Identification Number is 038518667.

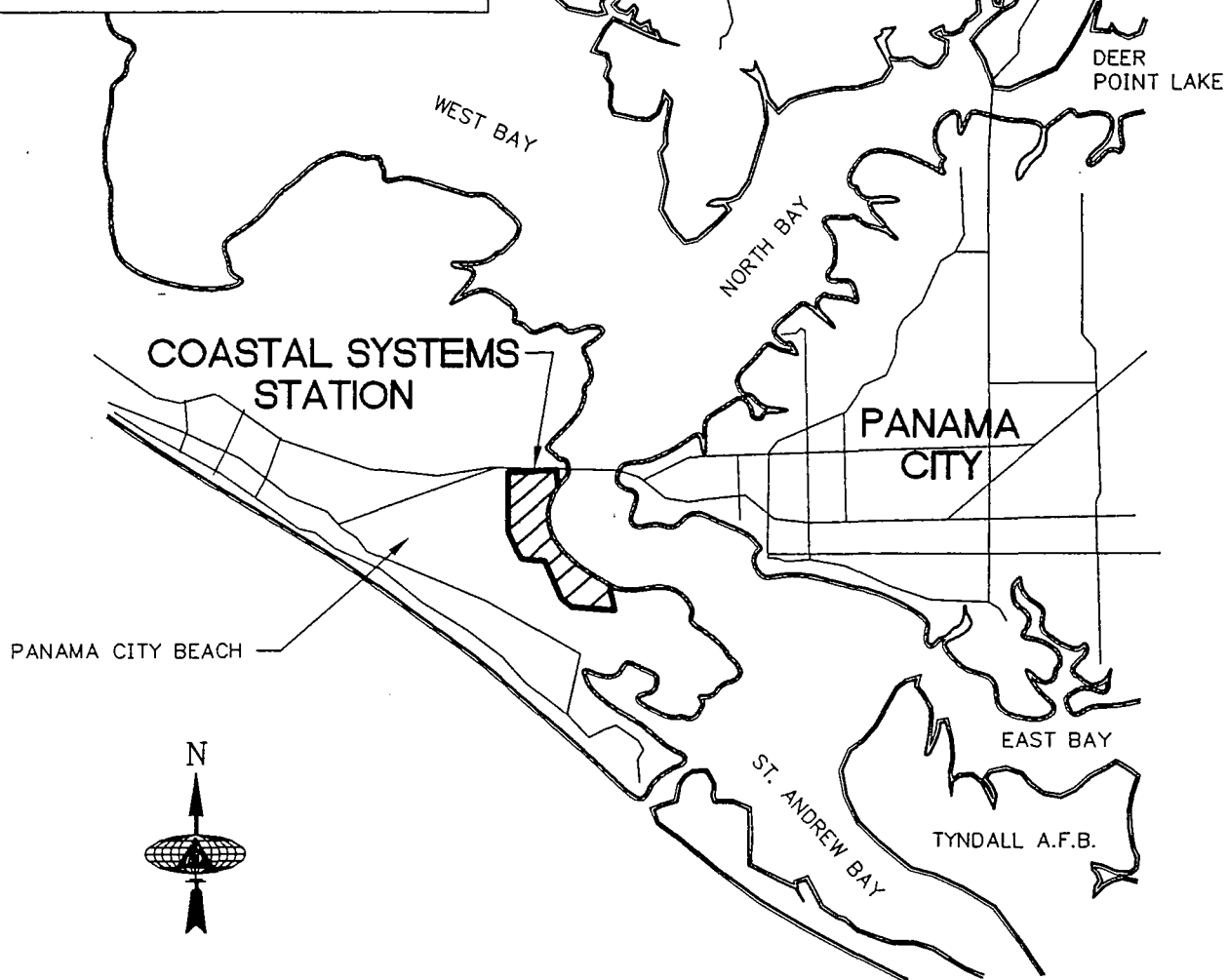
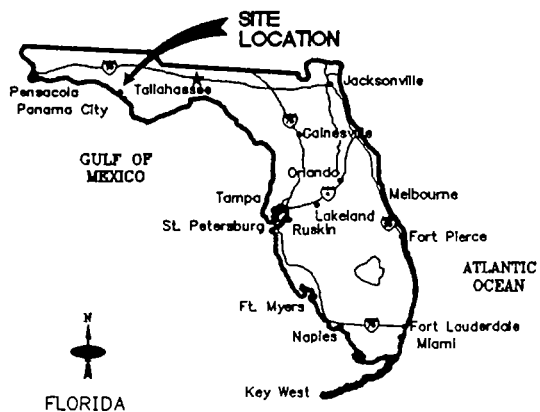
The purpose of this CA was to determine the nature and extent of petroleum hydrocarbons and used oil constituents in soil and groundwater in accordance with the requirements of Chapter 62-770 of the Florida Administrative Code (FAC). The Navy submitted a Discharge Notification Form (DNF) to the Bay County Health and Rehabilitative Services (HRS), Environmental Health Services, Pollution Storage Tank Program in December 1995. The discharge was reported based on soil vapor readings and groundwater quality testing conducted during removal of the site's waste oil tank and oil/water separator. The DNF listed the type of substance used as waste oil. The cause of the leak was reported on the DNF as unknown. A copy of the DNF report is included as Appendix A.

A CAR Summary Sheet, as required by Chapter 62-770, FAC., is included as Appendix B.

1.2 SITE DESCRIPTION

1.2.1 Location

The CSS facility is located on the western shore of St. Andrew Bay in Panama City, Bay County, Florida. The facility is bounded by U.S. Highway 98 to the north, St. Andrews Bay to the east, State Road 292B (Magnolia Beach Road) to the south and State Road 292 (Thomas Drive) to the west as shown on Figure 1-1. Specifically, the CSS facility is located within Section 33 of Township 3 South, Range 15 West and Section 4 of Township 4 South, Range 15 West, as shown on the United States Geological Survey (USGS) 7.5 Series (Topographic) Panama City Beach Quadrangle, Florida, presented as Figure 1-2.



Scale 1" = 13200'

MODIFIED RCRA FACILITY INVESTIGATION REPORT
(ABB ENVIRONMENTAL SERVICES, INC., 1995)

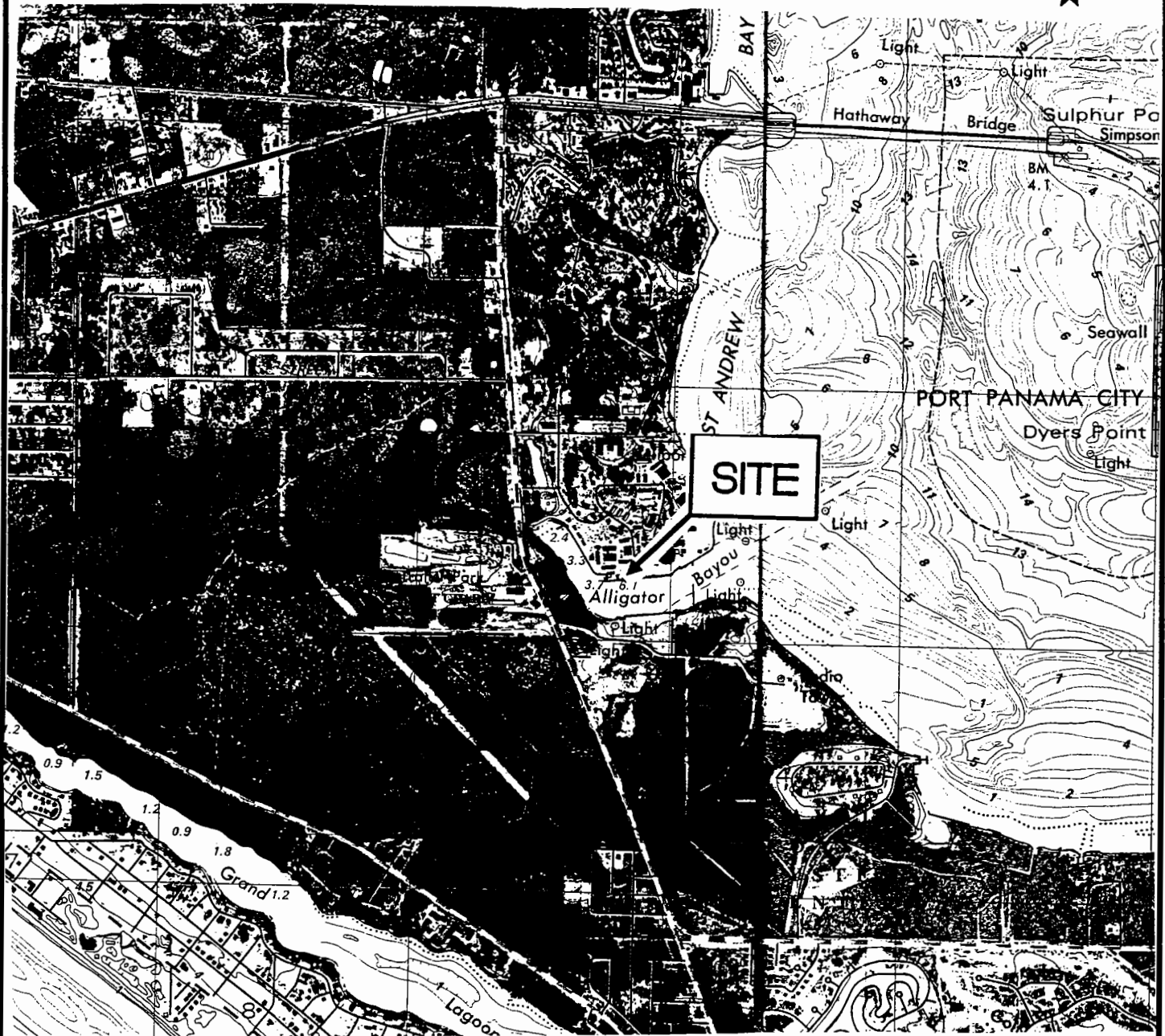
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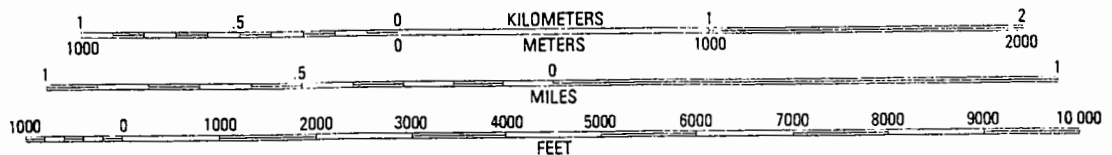
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FIGURE 1-1
SITE VICINITY MAP
SITE 333

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



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**FIGURE 1-2
SITE LOCATION
SITE 333**

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

1.2.2 Topography and Surface Water

The topography at the site is relatively flat with a gentle surface slope towards the south. The site is located at an elevation of approximately 7 feet above mean sea level. The nearest surface water body is Alligator Bayou located approximately 75 feet south of the site. Alligator Bayou is designated as a Class III surface water by the State of Florida, suitable for fish and wildlife propagation and water sports (ABB Environmental Services Inc., RCRA Facility Investigation, 1995).

1.2.3 Regional Hydrogeology

The regional hydrogeology of CSS Panama City is described in the RCRA Facility Investigation report (ABB Environmental Services, Inc., 1995). According to this report, surficial deposits at CSS are Pleistocene to Recent coastal plain sediment of marine and estuarine origin. They predominately consist of quartz sand, clayey sand, and gravel. These deposits vary in thickness from 70 to 100 feet in Bay County. The surficial aquifer is located within these deposits.

Underlying the surficial deposits is the Intercoastal Formation of middle Miocene to late Pliocene. The Intercoastal Formation is composed of sand and poorly consolidated limestone interbedded with discontinuous clay and low permeability sandy limestone. This formation is approximately 150 feet thick at CSS Panama City. The lower beds of the Intercoastal Formation are part of the Floridan aquifer system.

Groundwater at CSS occurs in two major aquifer systems: unconfined surficial aquifer and the Floridan aquifer system, which is under confined and artesian conditions. A third semi confined aquifer exists in thin permeable sand and shell zones within the Intercoastal Formation, and is separated from the water table aquifer and from the Floridan aquifer system by interbedded low-permeability clay and limestone. The Intercoastal Formation does not produce enough water to be considered a significant water source. The Floridan aquifer is under confined and artesian conditions where low-permeable clays and limestone beds of the Intracoastal Formation separate the water table aquifer from the Floridan aquifer. The surficial aquifer is reported to have insufficient thickness to produce significant quantities of water and its quality is generally undesirable for human use (i.e., dissolved solids, acidity, and iron content). Low permeability clay lenses in the surficial aquifer and the Intercoastal Formation are discontinuous. The surficial aquifer may be hydraulically connected to the Floridan aquifer system through semiconfining strata of the Intercoastal Formation.

1.2.4 Land Use

Site 333 is located in the southwest area of the CSS property as shown on Figure 1-3. This area of the Base is comprised of research facilities and various support activities. Potential sources of contamination near the site include a 6,000 gallon diesel underground storage tank (UST), CSS Tank No. 307R, hazardous drum storage structure 307, and Solid Waste Management Unit No. 1 (SWMU-1).

The 6,000 gallon double-walled fiberglass diesel fuel UST (CSS Tank No. 307R) includes double-walled product piping and is equipped with leak detection sensors. This tank provides diesel fuel to a dispenser located east of the boom containment wash area. The 6,000 gallon diesel UST was installed during the late 1980's as a system upgrade to replace a 5,000 gallon diesel UST. The 6,000 gallon diesel UST is located adjacent to the southeast end of the containment boom wash area. The location of 6,000 gallon diesel UST is shown on Figure 1-4.

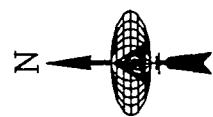
A hazardous drum storage area is contained in Structure 307. Structure 307 is secured with a locking chain link fence to restrict access to the area. The top of the structure contains a roof to shelter the drums from the sun and rain. The bottom of the structure contains concrete flooring with a floor drain to control and collect any spills which may occur. Structure 307 is located southeast of the boom containment wash area as shown on Figure 1-4.

The SWMU-1 is reported to extend beneath the boom containment wash area. SWMU-1 was a marshy depression which was used as a disposal area from approximately 1945 to 1953. This disposal area received general house hold wastes, food scraps, scrap metal, scrap lumber, and small quantities of paint, paint thinner, battery acids, solvents, and photographic chemicals. Waste oil and bilge water were also poured on the ground and burned (ABB Environmental Services Inc., 1995).

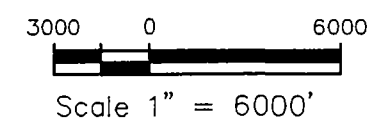
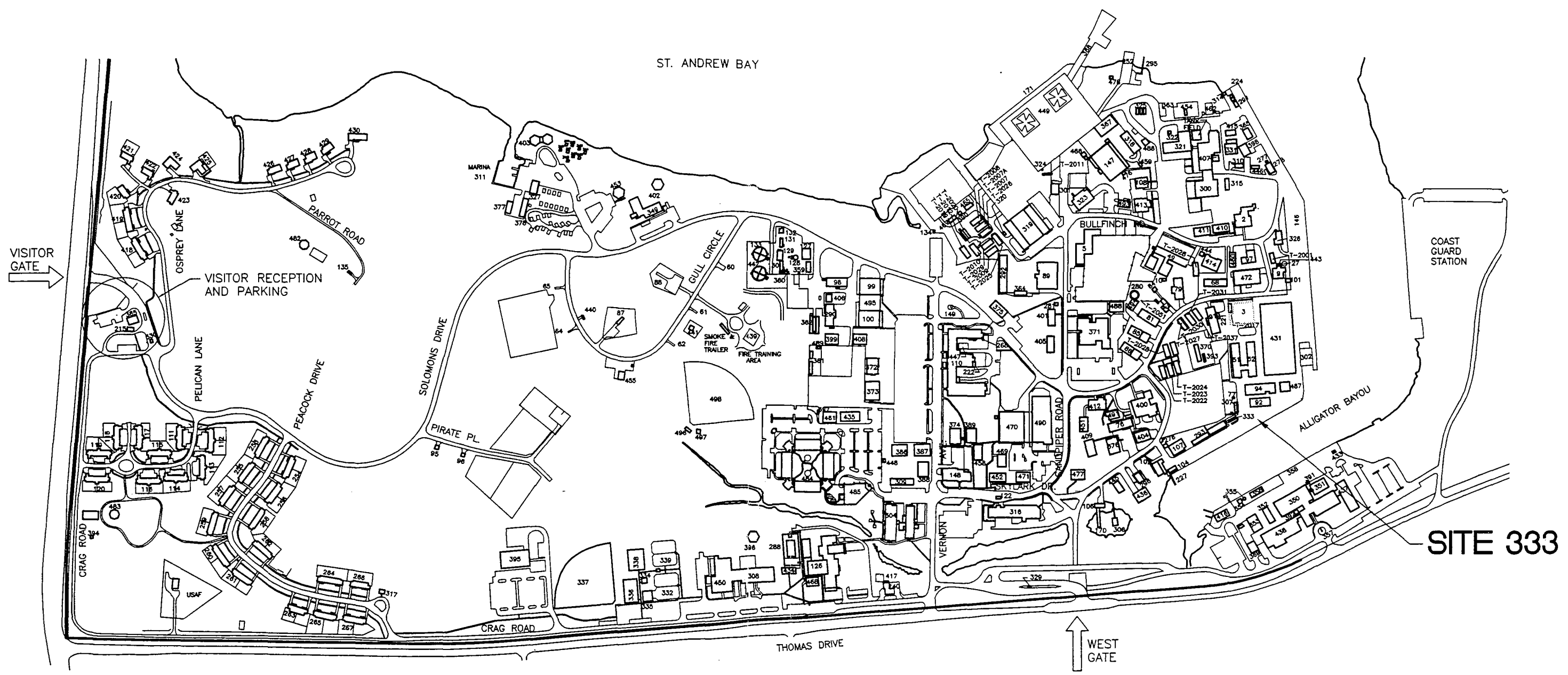
Underground utilities and petroleum distribution lines identified near Site 333 include diesel lines from the adjacent diesel UST, a 3-inch diameter gasoline line, sanitary sewer, gas, telephone, and water. Underground utilities are shown on Figure 1-4.

1.2.5 Site Description

Site 333 is a boom containment wash area. The site is primarily used as a containment area for the cleaning of booms used in the containment of diesel spills. An above ground 100 gallon per minute capacity oil/water separator and an underground 550-gallon fiberglass waste oil tank (underground



ST. ANDREW BAY



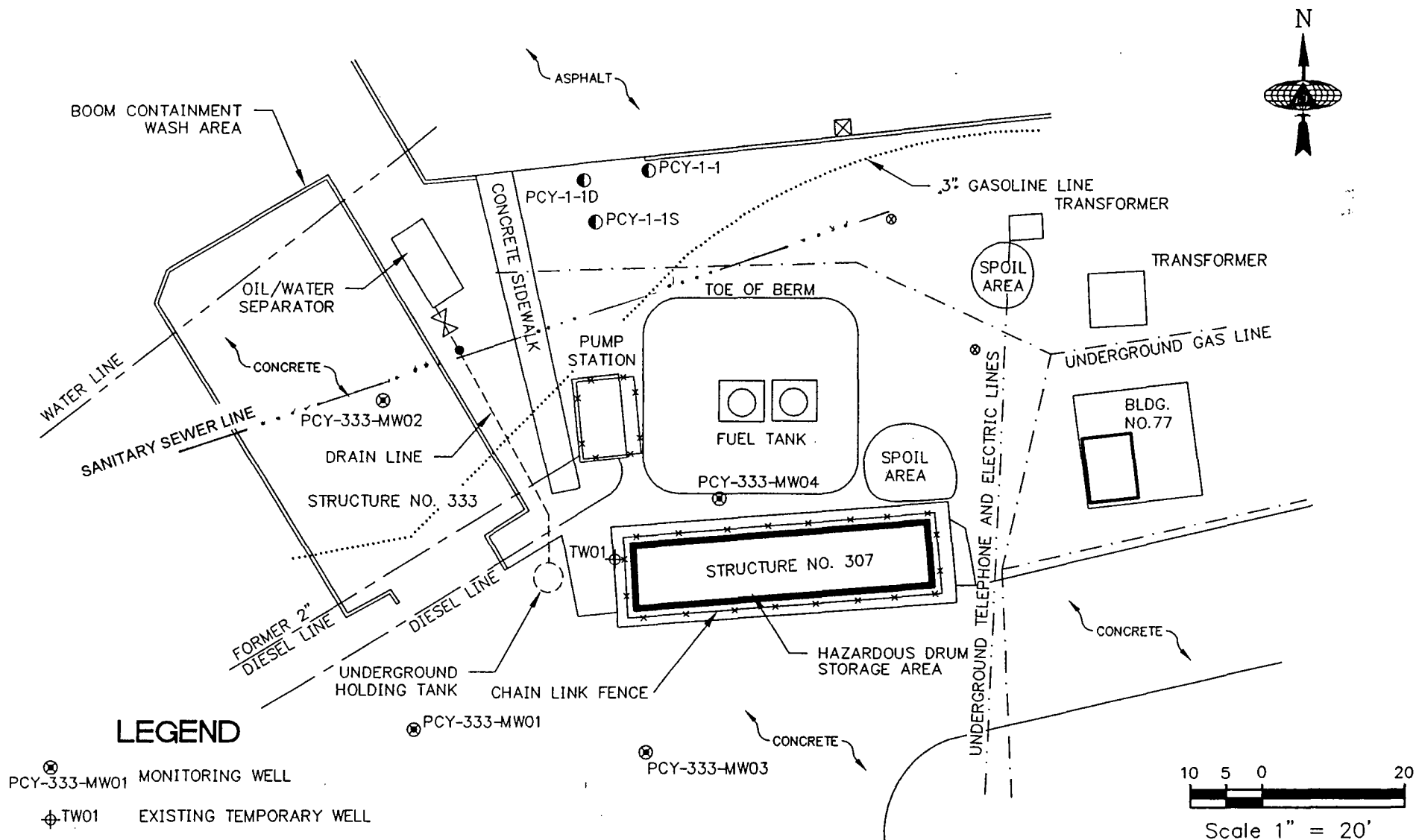
SITE 333

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FIGURE 1-3
NAVAL FACILITY SITE LOCATION
RCRA FACILITY INVESTIGATION REPORT
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA



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FIGURE 1-4
SITE PLAN
SITE 333
 COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA

holding tank) are used to collect and process rinse water from the cleaning of the booms. Rinse water from the containment area is drained into sumps then pumped to the oil/water separator. Any oils collected in the separator are gravity drained into the waste oil tank. Water in the oil/water separator then drains into the Navy's sanitary sewer system. The oil/water separator also receive water from a floor drain in structure 307. Existing site features are shown on Figure 1-4.

1.2.6 Potable Water Well Survey

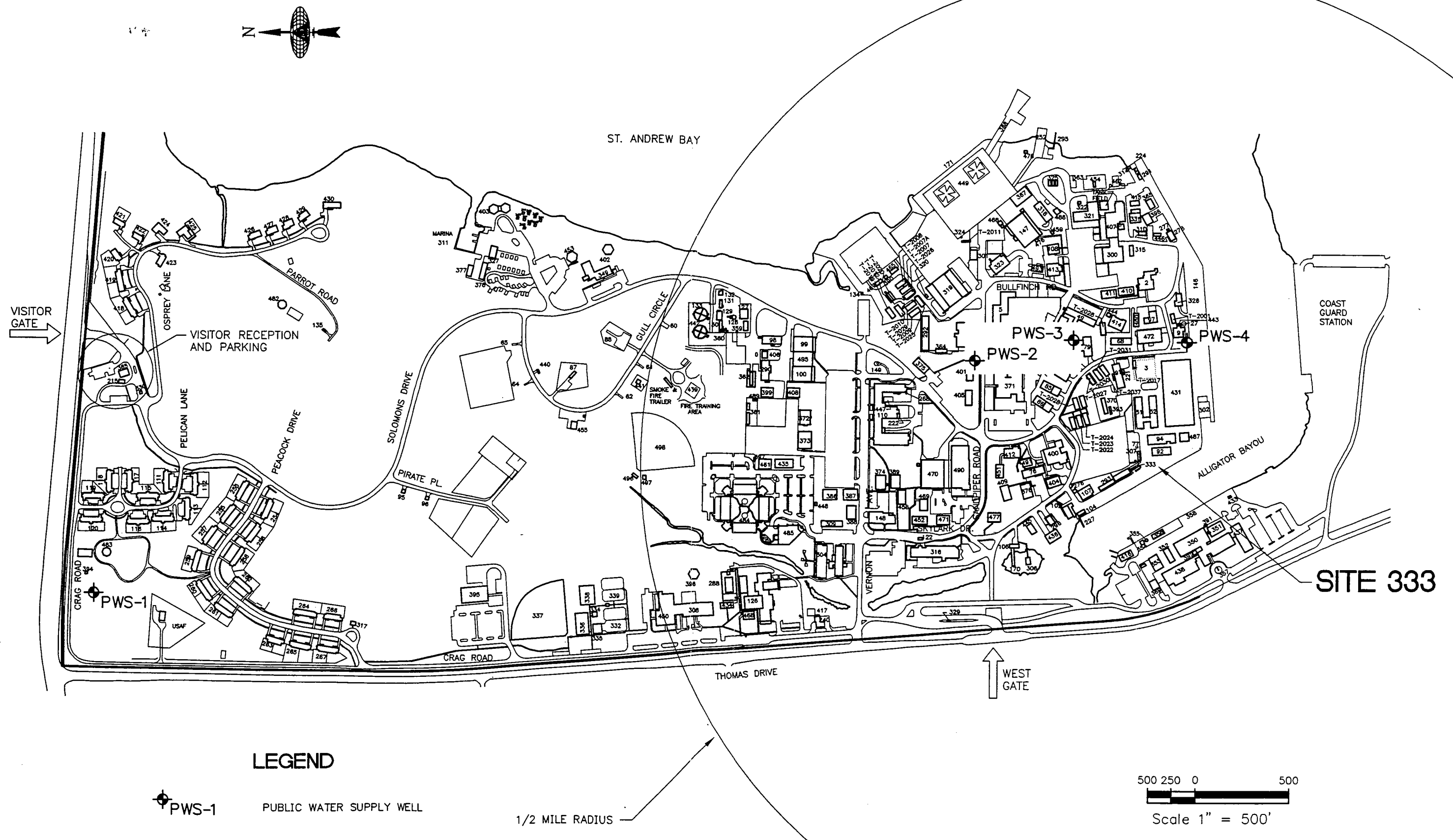
The potable water supply information presented in this report was obtained from the Resource Conservation and Recovery Act (RCRA) Facility Investigation completed for CSS (ABB Environmental Services Inc., 1995). According to this report, potable water for most of Panama City and Panama City Beach, including CSS, is supplied by surface water. Panama City Beach also uses groundwater from the Floridan aquifer system, as do private and domestic water systems throughout Bay County.

The CSS is provided potable water from the Bay County Water System, operated by the Bay County Public Utilities Department. The system draws surface water from Deer Point Lake, located 7 miles northeast of CSS. The use of county water in urban areas such as Panama City, has been reported at 83 to 95 percent.

Panama City Beach operates a public water system which uses a combination of groundwater withdrawal and surface water. The groundwater is obtained from 13 wells located in western Bay County and surface water is purchased from the county water system.

The RCRA Facility Investigation report indicates records from the Northwest Florida Water Management District list 42 permitted wells screened in the surficial aquifer system in the vicinity of CSS. These 42 wells are classified as domestic or other public supply. The permitted wells are 2-inch and 4-inch-diameter wells with capabilities generally less than 20 gallons per minute.

Four public water supply wells are located at CSS. The location of the wells are provided on Figure 1-5. These wells have 12-inch diameter casings and are completed at depths of 350 to 400 feet below land surface (bls). Of the four wells, only PWS-1, located near the housing area at Building 394 adjacent to highway 98, is currently in use. It is used to provide water for air conditioning and heat pumps only and draws water from the Floridan aquifer system at approximately 400 feet bls. The remaining wells are inactive.



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FIGURE 1-5
 LOCATION OF PUBLIC WATER SUPPLY WELLS
 RCRA FACILITY INVESTIGATION REPORT
 COASTAL SYSTEMS STATION - SITE 333
 PANAMA CITY, FLORIDA

No private potable wells or public potable supply wells were identified in the RCRA Facility Investigation report as being within a 1/4-mile and 1/2-mile radius of the site, respectively.

1.3 SITE HISTORY AND OPERATIONS

1.3.1 Site History

CSS is one of seven major research, test, and evaluation laboratories of the Space and Naval Warfare Systems Command. The site was first established in 1942 as a harbor for World War II convoy ships and as a liaison with a nearby shipyard. It later became an amphibious landing craft operations school. Research and development began in 1945 when the facility was renamed the U.S. Navy Research Countermeasures Station. In 1952 a research and development program for the use of helicopters for mine countermeasures operations was implemented at the Base. The facility was redesignated as the Naval Coastal Systems Center in 1978 and again as Coastal Systems Station in January 1992 (ABB Environmental Services, Inc. 1995).

Site 333 is utilized as a spill containment boom wash area. The site consists of a containment area, an underground waste oil tank (holding tank) and oil water/separator. The oil/water separator was primarily used to collect rinse water from diesel booms used to contain spills. Bowser-tank trucks used to haul waste oil were previously stored in the boom containment wash area. Some used oil from these trucks may have been processed through the oil/water separator system. The oil/water separator also receives water from a floor drain from Structure 307. Structure 307 is used as a hazardous drum storage area.

In November 1995, the oil/water collection system at Site 333 was upgraded. The system upgrade including the removal and replacement of a 550 gallon waste oil tank, removal of a below surface grade oil/water separator, and replacement of underground piping associated with the oil/water collection system. Prior to November 1995, a second oil/water separator with a 5 gpm capacity existed at Site 333. The separator was located south and adjacent to the above ground oil/water separator. This separator received water from the floor drain in Building 307 and from floor drains in the boom containment area. Any oils collected in the separator gravity drained into the 550-gallon fiberglass underground waste oil tank. Review of construction plans show the oil/water separator collection system which was upgraded was installed in the late 1970's (NAVFAC DRAWING No. 504-6560).

1.3.2 Structural Integrity of Tanks and Lines

No structural integrity testing on the oil/water separator tank, waste oil tank, or integral piping were performed prior to removal.

1.3.3 Previous Investigations

A Tank Closure Assessment was performed by Southern Waste Services (SWS) in November 1995. During removal of the oil/water separator, waste oil tank, and integral piping, SWS collected soil samples from the vadose zone soils for hydrocarbon vapor screening using an organic vapor analyzer (OVA). Four soil sampling points were established at the corners of the excavation for the waste oil tank. Three sampling points were located along the piping trench and within the oil/water separator area. Results of the soil vapor screening identified "excessively contaminated" as defined by Chapter 62-770.200 FAC., near the southeast corner of the excavation pit for the waste oil tank. Hydrocarbon vapor concentrations in the soil samples from the excavation near the holding tank ranged from less than 10 ppm to 950 ppm. Further investigation identified a greenish dark gray oily sheen within the smear zone of the water table. Soil vapor readings of soils collected along the pipe line trench and oil/water separator identified hydrocarbon vapors at concentrations of less than 10 ppm.

Two additional exploratory borings were conducted by SWS in the area between the drum containment fence and the excavation for the waste oil tank. These borings were advanced to the water table. "Excessively contaminated" soils were identified at each boring location at a depth of 4.5 feet below land surface (bls). Diesel or old hydrocarbon fuel odors were detected. A greenish gray oily soil was identified at the capillary fringe zone in one of the borings at 4.5 feet bls.

A composite soil sample for laboratory analysis was collected during the waste oil tank excavation. The sample was collected at a depth of 4 feet bls and analyzed for Volatile Organics (EPA Method 8240), Semivolatile Organics (EPA Method 8270), Total Recoverable Petroleum Hydrocarbons (TRPH) (EPA Method 9073) and RCRA Metals. In addition, soil samples were collected from the excavation wall adjacent to the oil/water separator and from the area between the drum containment and holding tank area (samples were collected at approximately 4.5 feet bls). These samples were subject to the laboratory analysis mentioned above. A composite sample was also collected from the excavated soil for lab analyses, including TCLP Volatiles and TCLP metals.

Laboratory results of the soil analyses reported Volatile Organics and TCLP Volatiles and TCLP metals below laboratory detection limits. Concentrations of RCRA metals, TRPH, 1-methynaphthalene, 2-methy naphthalene, and naphthalene were detected in the soils. Lead, cadmium, silver, and mercury were detected at 30.4 mg/kg, 1.0 mg/kg, and 0.104 mg/kg, respectively. The highest concentrations of barium and chromium were reported at 2.3 mg/kg, respectively. The highest concentrations of TRPH, 1-methy naphthalene, 2- methylnaphthalene, and naphthalene were reported in soils collected near the holding tank at concentrations of 960 mg/kg, 4,800 mg/kg, 7500 mg/kg and 1,300 mg/kg, respectively.

A temporary groundwater monitoring well screened into the top of the water table was installed in the area adjacent to the holding tank. A groundwater sample was collected from the well on December 15, 1995 and analyzed for Volatile Aromatic Hydrocarbons (EPA Method 602), and Polynuclear Aromatic Hydrocarbons (EPA Method 610). Results of the sampling event report benzene, ethyl benzene, and xylenes at concentrations of 1.5 ug/L, 1.0 ug/L, and 5.2 ug/L, respectively. 1-Methynaphthalene was detected in the groundwater at 49 ug/L.

An Initial Remedial Action (IRA) Notification Form reported approximately 2 cubic yards of "excessively contaminated" soil was removed from the waste oil tank excavation during the tank closure assessment activities. The IRA Notification Form is included in Appendix A and the Tank Closure Assessment Report is provided in Appendix C.

2.0 SUBSURFACE INVESTIGATION METHODS

2.1 QUALITY ASSURANCE

The site investigation was conducted in accordance with the Standard Operating Procedures prescribed by the FDEP Quality Assurance Section Document DER-001/92, and adopted by the B&R Environmental Comprehensive Quality Assurance Plan Number 870055G.

2.2 SOIL BORING PROCEDURES

2.2.1 Hand-Augured Soil Borings

A soil hydrocarbon vapor assessment was conducted at the site by B&R Environmental on June 10 through 12, 1996. Twelve soil borings (SB01 through SB12) were excavated in the immediate area surrounding the oil/water separator and waste oil tank. Soil samples were collected from each boring for the purpose of organic vapor screening and for lithologic description. Results of the soil vapor screening would be collaborated with the soil vapor data collected during removal of the oil/water separator to determine the horizontal and vertical extent of petroleum contamination in the vadose zone. Soil borings were advanced using a 3.5 inch inside diameter (ID) stainless steel bucket auger. Soil samples were collected at two foot intervals until the water table was encountered. Wet soils were present at depths ranging from approximately 4 to 5 feet bls. Soil boring locations and soil sample collection depths are summarized on Figure 2-1 and Table 2-1, respectively. Soil boring logs are provided in Appendix D.

Prior to the advancement of the hand auger at each boring location, the hand auger was decontaminated according to B&R Environmental Comprehensive Quality Assurance Plan.

2.2.2 Drilling and Soil Sampling Methods

From June 11 through June 13, 1996, borings for monitoring wells PCY-333-MW01, PCY-333-MW02, PCY-333-MW03 and PCY-333-MW04 were drilled by Groundwater Protection, Inc. under the supervision of a B&R Environmental geologist. The borings were advanced to facilitate the installation of groundwater monitoring wells. Soil samples collected during the borehole advancements were used to characterize the site lithology and provide additional assessment data on soil hydrocarbon vapor concentrations in the area. The location of the borings are shown

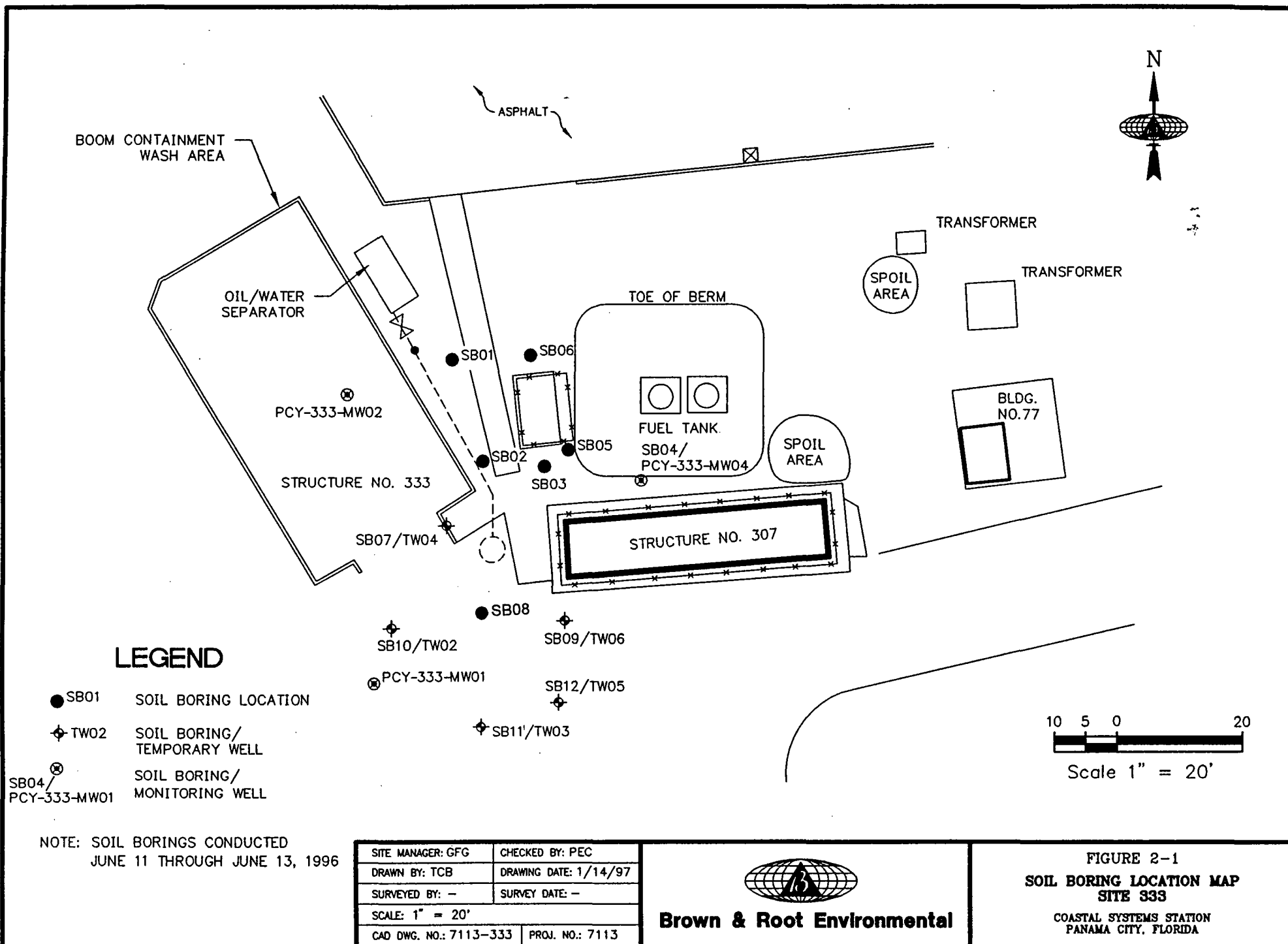


TABLE 2-1
SOIL VAPOR MEASUREMENTS
Coastal Systems Station
Site 333
Panama City, Florida
FDEP FACILITY No. 038518667

Soil Boring No.	Date of Measurement	Sample Interval (feet bls)	Headspace Readings (ppm)		
			Total Organic Reading	Carbon Filtered Reading	Net Reading
SB01	06-10-96	2	5	3	2
		4	ND	ND	ND
SB02	06-10-96	2	ND	ND	ND
		4	10	8	2
SB03	06-11-96	2	10	8	2
		4	29	10	19
SB04 (PCY-333-MW04)	06-11-96	2	2	ND	2
		4	2	ND	2
SB05	06-11-96	2	ND	ND	ND
		4	9	9	ND
SB06	06-11-96	2	ND	ND	ND
		3	4	4	ND
SB07 (TW04)	06-11-96	2	ND	-	ND
		4	ND	-	ND
SB08	06-11-96	2	ND	ND	ND
		4	ND	ND	ND
SB09 (TW06)	06-11-96	2	3	2	1
		4	5	2	3
SB10 (TW02)	6-11-96	2	ND	ND	ND
		4	ND	ND	ND
SB11 (TW03)	6-11-96	2	1	ND	1
		4	1	ND	1
SB12 (TW05)	6-12-96	2	ND	ND	ND
		4	5	5	ND
PCY-333-MW01	6-12-96	2	ND	ND	ND
		4	ND	ND	ND
PCY-333-MW02	6-12-96	2	ND	ND	ND
		4	8	2	6
PCY-333-MW03	6-13-96	2	ND	ND	ND
		4	ND	MD	ND

Notes:

- = not analyzed

bls = below land surface

ppm = part per million equivalent methane

Wet soils encountered at approximately 4.5 feet bls.

on Figure 2-1, and soil boring logs are included in Appendix D.

Buried utilities were investigated at each boring location by advancing the soil boring with a post hole digger from 0 to 4 feet bls. The borings were continued with a truck mounted drill rig, using 4 1/4-inch (ID) hollow stem augers. Soil samples were collected using a split spoon sampler and standard penetrations tests were conducted in accordance with the American Society for Testing and Materials (ASTM) D-1586 recommended procedures.

Prior to the collection of the soil samples and well installations, the auger flights, drill rods, and split spoons were decontaminated according to B&R Environmental Comprehensive Quality Assurance Plan.

Soil samples were visually inspected for evidence of oil staining. Headspace analysis was conducted on each soil sample collected above the water table during the soil vapor assessment. Grab samples were collected at two foot intervals from approximately 0 to 4 feet bls. Soil vapor analysis was performed in accordance with the headspace method presented in detail in Appendix E. Hydrocarbon vapor concentrations from soil vapor analysis are summarized in Table 2-1.

Soil cuttings generated during the well installations were placed in a 55-gallon steel drum. A composite soil sample was collected from the drum and analyzed for TCLP (SW-846 1311) organics and metals, reactivity, and corrosivity. The soil will be transported for disposal by a licensed Florida waste hauler.

2.3 WELL CONSTRUCTION

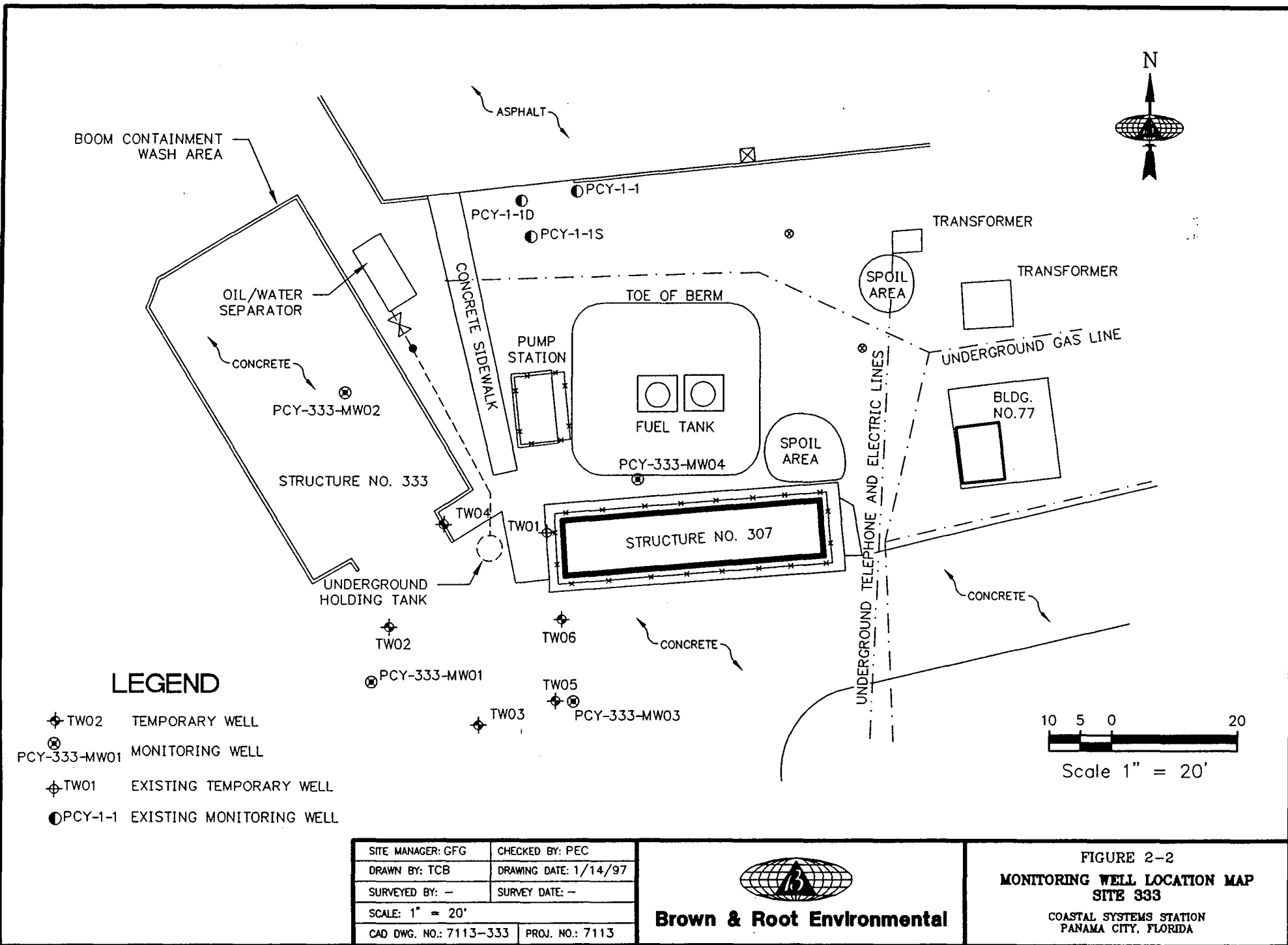
During the soil vapor assessment, temporary groundwater monitoring points TW02, TW03, TW04, TW05 and TW06 were installed in the hand augured soil borings for SB10, SB11, SB07, SB12, and SB04, respectively. These boring locations were selected for monitoring point installations based on the detection of fuel like odors in soil samples collected at the water table during the soil vapor survey. A groundwater sample was obtained from each of the temporary monitoring points using a disposable Teflon bailer. The sample was screened on-site for benzene, toluene, ethyl benzene, and xylenes, utilizing an HNU Systems Model 311D GC portable gas chromatograph (GC). Results of the GC screening were used to evaluate the optimum placement for a permanent monitoring well(s). Each temporary groundwater monitoring point was constructed of

2-inch ID threaded schedule 40 PVC solid riser and 0.010-inch slots with silt trap and well bottom cap. Each monitor point was completed with 2 feet of well screen. The monitoring point was inserted into the boring annulus and hand-pushed into the top of the water table. Upon collection of the groundwater sample, the monitoring point was pulled from the boring and a one foot plug of bentonite pellets was placed at the bottom of the boring and hydrated. The remainder of the boring was then backfilled with the soil cuttings. Each monitoring point was delivered to the site factory wrapped in plastic. Prior to installing the monitoring points, the casings and well screens were decontaminated as follows:

- Laboratory grade detergent and potable water wash
- Potable water rinse
- Isopropanol rinse
- Deionized water rinse
- Air dry

Groundwater Protection, Inc., under the supervision of a B&R Environmental geologist, installed permanent monitoring wells PCY-333-MW01 through PCY-333-MW04 on June 12 and 13, 1996. The wells were installed in conjunction with the soil boring procedures discussed above in Section 2.2.2. Each well was screened to intersect the water table and was located adjacent to the oil/water separator location. Analysis of groundwater samples collected from the well would be used to evaluate water quality in the area of the oil/water separator and underground storage holding tank. Monitoring locations are show on Figure 2-2.

The borings for monitoring well PCY-333-MW01 through PCY-333-MW03 were drilled with 4 1/4-inch (ID) hollow stem augers and a Diedrick D 120C Model drill rig. Monitoring well PCY-333-MW04 was installed using a 3.5 inch ID stainless steel bucket auger due to restricted drill rig access at location SB04. The wells were constructed of 2-inch ID, threaded, schedule 40 PVC, solid riser and 0.010-inch slots with silt trap and well bottom cap. Each well was completed at approximately 13 feet below land surface. The boring annulus was filled to approximately 1 foot above the well screen with 20/30 silica sand. A one foot layer of bentonite pellets was placed above the sand pack and hydrated. The remainder of the well annulus was grouted to within 3 inches of the top of well casing. The well was secured with a locking, water-tight cap within a 8-inch diameter steel manhole. The manhole was set within a 24-inch square concrete apron finished slightly above grade. The top of the well is secured with a locking, water-tight cap. Well completion logs are provided in Appendix F.



The wells were developed using a centrifugal pump. During well development, field measurements of pH, temperature, and specific conductance were monitored from the purge water. Each well was developed up to a maximum of one hour or until the field measurements became stable and the purge water clear. Water quality stabilization was determined using the following criteria: temperature $\pm 0.5^{\circ}\text{C}$, pH ± 0.1 unit, and specific conductance ± 10 umhos/cm. The wells were developed under the supervision of a B & R Environmental geologist. All development water will be removed for proper disposal by a Florida licensed waste hauler.

2.4 LITHOLOGIC SAMPLING

Representative soil samples were collected to assess the shallow subsurface geologic conditions at the site. Samples used for lithologic description were collected from a stainless steel hand auger or split spoon sampler during the soil boring and monitoring well installations. Soil boring logs are included as Appendix F.

2.5 SOIL VAPOR ANALYSIS

Headspace analysis was conducted on each soil sample using an Organic Vapor Analyzer-Flame Ionization Detector (OVA-FID). The soil vapor analysis was performed according to the headspace method prescribed in Rule 62-770.200 (2) FAC. Screened soil samples with corrected headspace levels in excess of 50 ppm are defined as "excessively contaminated" soil at diesel and used oil contaminated sites. The headspace methodology for determining soil organic vapor concentrations is described in detail in Appendix E.

2.6 SOIL SAMPLE ANALYSIS

Analysis of soil samples collected during the Tank Closure Assessment were used to determine the presence or absence of petroleum hydrocarbons or waste oil constituents in the area of the oil/water separator and holding tank. No additional subsurface soil samples were collected for laboratory analysis during the contamination assessment investigation. Soil sample collection and parameters analyzed during the Tank Closure Assessment are discussed in Section 1.3.3. Soil quality results from the Tank Closure are included in Appendix C.

2.7 HYDROLOGIC INVESTIGATION

2.7.1 Water Level Measurements

The depth to water was measured in existing site wells PCY-1-1S and TW01, and in monitoring wells PCY-333-MW01 through PCY-333-MW04, on July 11, 1996 and November 25, 1996. Monitoring well PCY-1-1S was installed as part of the Resource Conservation and Recovery Act Facility Investigation for SWMU-1 (ABB Environmental Services Inc., 1995). This well is a 2-inch ID PVC well screened to intersect the water. The well terminates at approximately 13 feet bls. Existing temporary well TW01 was installed during the Tank Closure Assessment completed for Site 333. TW01 is constructed of 2-inch ID PVC and is screened from 3 to 8 feet bls.

Water level measurements were collected from the top of well casings using an electronic water level indicator. Each top of well casing was surveyed to the National Geodetic Vertical Datum (NGVD) 1929 by a Florida licensed Professional Land Surveyor. Subtracting the depth to water level measurements from the well top casing elevations provided the water table elevation relative to the NGVD. The water level field forms and field elevation survey data are included in Appendix H. The water table gradient across the site was evaluated from water level measurements collected on July 11, 1996. The groundwater gradient was calculated by determining the perpendicular distance between groundwater contours developed from groundwater elevation data. Gradient calculations are included in Appendix G. The hydraulic conductivity value obtained from the RCRA Field Investigation study for SWMU-1 was used in calculating the site's groundwater velocity. The effects of tidal influence on the site was evaluated from tidal survey data collected for the RCRA Field Investigation for SWMU-1.

2.7.2 Aquifer Characteristics

The hydraulic conductivity value obtained from the RCRA Field Investigation study for SWMU-1 was used to evaluate the hydraulic conductivity and groundwater velocity for the site.

2.7.3 Groundwater Flow Velocity and Transmissivity

The groundwater flow gradient was evaluated using the following equation:

$$i = (h_1 - h_2)/d$$

where:

- i = the hydraulic gradient
- h_1 = the water elevation at point 1
- h_2 = the water elevation at point 2
- d = the distance between point 1 and point 2

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone while assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \frac{(K*i)}{n_e}$$

where:

- V = average velocity
- K = hydraulic conductivity
- i = hydraulic gradient
- n_e = effective porosity

Site specific transmissivity is calculated using the following equation:

$$T = K*b_e$$

where:

- T = transmissivity
- K = hydraulic conductivity
- b_e = effective aquifer thickness

The groundwater flow velocity and aquifer transmissivity calculations are included in Appendix G.

2.7.4 Tidal Influence Survey

A tidal survey was conducted during the RCRA Facility Investigation to determine if the hydraulic gradient at locations close to Alligator Bayou is influenced by tidal fluctuations. Continuous water level measurements were obtained from several selected monitoring wells for a period of 24 hours. Monitoring wells PCY-14-5 and PCY-1-3 were selected at SWMU 1 and Area of Concern (AOC) 2, to evaluate the effects of tidal influence by Alligator Bayou. Monitoring well PCY-14-5 is located 40 feet from the seawall at Alligator Bayou and was paired with PCY-1-3, located 200 feet from the Bayou.

2.8 WATER SAMPLING

2.8.1 Free Product Sampling

Prior to groundwater sampling, B&R Environmental personnel checked each well for free product using a pre-cleaned Teflon® bailer. The Teflon® bailer was used to extract a water sample from the top of the well's water column to visually inspect for free product. Oil films (films less than 0.01 foot thick) were observed in wells PCY-333-MW04 and TW01 on July 11, 1996. A free product thickness of 0.15 feet was detected in the well PCY-333-MW04 on November 25, 1996.

2.8.2 Groundwater Sampling

Groundwater sampling was performed to determine the presence or absence of dissolved petroleum hydrocarbons or used oil constituents in shallow groundwater in the vicinity of the former oil/water separator. Groundwater samples were collected by B&R Environmental personnel from wells PCY-333-MW01, PCY-333-MW02, PCY-333-MW03, and PCY-1-1S on July 11, 1996. Groundwater samples were analyzed by ICP Series for lead, arsenic, cadmium, and chromium (all metal analysis were unfiltered), EPA Method 504.1 for Extractable Volatile Organic (1,2-dibromoethane EDB), EPA Method 601 for Purgeable Halocarbons, EPA Method 602 for Purgeable Aromatics (benzene, toluene, ethyl benzene, and methyl-tert butyl ether), EPA Method 610 for PAHs, SW-846 Method 8260 for GC/MS Volatile Organics, SW-8468 Method 8270A for GC/MS Semivolatile Organics and EPA Method 418.1 for Total Petroleum Hydrocarbons. The lead, arsenic, and chromium samples were collected using new silicon tubing and a peristaltic pump. The remainder of the groundwater parameters analyzed during the sampling event were collected using pre-cleaned Teflon® bailers. Approximately five well volumes of groundwater were removed from each well using a pre-cleaned Teflon® bailer. Temperature, pH, specific conductance measurements and well purge volumes were recorded at the time of sample collection and are provided in Appendix H. Groundwater samples were placed on ice and shipped via overnight courier to Quality Analytical Laboratories, Inc., Montgomery, Alabama.

Groundwater samples were not collected from wells PCY-333-MW04 and TW01 during the July 11 sampling event due to the presence of an oil film in the water at the well locations. The oil films were identified during visual inspection of the water clarity using a Teflon® bailer. On November 25, 1996, groundwater samples were collected from wells PCY-333-MW04 and TW01 for the test parameters, as referenced above. During the November 25 sampling event, no product film was observed on the water in TW01. A free product thickness of 0.15 feet was measured in PCY-333-

MW04. Prior to sample collection, the product in the well was bailed and removed from the well. An unfiltered lead sample was also collected from PCY-333-MW02 during the November sampling event to provide additional data to evaluate lead concentrations in the area near PCY-333-MW02.

Groundwater samples were collected in accordance with the FDEP Quality Assurance Document DER-001/92. During the sampling events, quality control samples (i.e. equipment blanks, trip blanks, duplicate) were prepared and submitted to the laboratory as required by the approved QA procedures. Sampling activities were documented in a site specific field logbook, and samples were transmitted under chain-of-custody protocols.

3.0 RESULTS OF INVESTIGATION

3.1 SITE HYDROGEOLOGY

3.1.1 Lithology

Lithologic samples collected by B&R Environmental indicate the site is predominantly underlain by dark-gray, to light-tan, fine to medium grained sand and silty sand to a depth of approximately 13 feet bls. Due to the homogeneity of the subsurface, no lithologic cross-section was constructed. Soil boring logs are included as Appendix E.

The RCRA Facility Investigation (ABB Environmental Services, Inc., 1995) indicates sand is the primary soil type encountered to a depth of 27 feet bls at well PCY-1-1D, located approximately 40 feet northeast of the oil/water separator. A dark green sandy clay and clayey sand is present at this locality between 27 and 35 feet bls. The sand, sandy clay, and clayey sand deposits in the surficial aquifer are underlain by olive-green, fossiliferous, clayey limestone of the Intracoastal Formation at a depth of 48 feet bls.

3.1.2 Aquifer Characteristics and Classification

Based on water level data collected from site monitoring wells on July 11 and November 25, 1996, the depth to the shallow aquifer at the site is approximately 4 to 5 feet bls. The groundwater level measurements are presented in Table 3-1. The water level measurement field forms are provided in Appendix H. The aquifer is classified as a G-II aquifer based on dissolved solids content typically associated with the surficial aquifer in the area of CSS.

Rising head slug tests of the surficial aquifer at CSS for the area of SWMU-1 were conducted to estimate the hydraulic conductivity during the RCRA Facility Investigation. The geometric mean hydraulic conductivity for the surficial aquifer for SWMU-1 was estimated at 4.98×10^{-3} feet/minute (7.1 ft/day) (ABB Environmental Services Inc., 1995). Due to the proximity of Site 333 to SWMU-1, the hydraulic conductivity value determined for SWMU-1 was used for Site 333.

Using the groundwater flow gradient equation presented in Section 2.7.3, a hydraulic gradient of 0.05 feet/foot to the south-southwest was calculated from the data collected on July 11, 1996; these data are represented in Figure 3-1. The November 25, 1996, water level data indicates a

TABLE 3-1
DEPTH TO GROUNDWATER MEASUREMENTS
Site 333
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Monitoring Well ID	Date	Top of Well Casing Elevation (feet NGVD)	Free Product Thickness (feet)	Depth to Water (feet bls)	Water Table Elevation (feet NGVD)	Well Screen Interval (feet bls)
PCY-333-MW01	07/11/96	6.65	0.00	4.60	2.05	3 to 13
	11/25/96	6.65	0.00	4.77	1.88	
PCY-333-MW01	07/11/96	6.39	0.00	4.20	2.19	3 to 13
	11/25/96	6.39	0.00	4.40	1.96	
PCY-333-MW-03	07/11/96	6.57	0.00	4.31	2.26	3 to 13
	11/25/96	6.57	0.00	4.58	1.99	
PCY-333-MW04	07/11/96	7.75	<.01	5.25	2.50	3 to 13
	11/25/96	7.75	0.15	5.80	1.95	
PCY-1-1S	07/11/96	9.48	0.00	5.15	4.33	2 to 10
	11/25/96	9.48	0.00	6.60	2.88	
TW01	07/11/96	8.70	<0.01	5.44	3.26	5 to 15
	11/25/96	8.70	0.00	6.76	1.94	

Notes: bls = below land surface.
ID = identification
NGVD = elevation relative to the National Geodetic Vertical Datum 1929.

BOOM CONTAINMENT
WASH AREA

OIL/WATER
SEPARATOR

PCY-333-MW02
(2.19)

STRUCTURE NO. 333

CONCRETE
SIDEWALK

PUMP
STATION

PCY-1-1

PCY-1-1D

PCY-1-1S
(4.33)

TOE OF BERM

DIESEL FUEL TANK

PCY-333-MW04
(2.50)

SPOIL
AREA

STRUCTURE NO. 307

TRANSFORMER

TRANSFORMER

BLDG.
NO. 77

LEGEND

PCY-333-MW01

MONITORING WELL

PCY-1-1

EXISTING MONITORING WELL

GROUNDWATER FLOW DIRECTION

GROUNDWATER CONTOUR

GROUNDWATER ELEVATION

PCY-333-MW01
(2.05)

PCY-333-MW03
(2.26)

10 5 0 20

Scale 1" = 20'

SITE MANAGER: GFG	CHECKED BY: PEC
DRAWN BY: TCB	DRAWING DATE: 1/14/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



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FIGURE 3-1

**WATER TABLE ELEVATION CONTOUR MAP
JULY 11, 1986 (SITE 333)**

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

much flatter flow gradient (.002 feet/foot) toward the south-southwest as shown on Figure 3-2.

Lithologic data and available literature indicate the effective porosity of the sediments comprising the surficial aquifer is approximately 0.30 (Heath, 1994).

Using a hydraulic conductivity of 7.1 feet/day, the hydraulic gradient of 0.05 feet/foot, an inferred effective porosity value of 0.30, and Darcy's Equation as stated in Section 2.7.3, the groundwater flow velocity across the site is calculated at 1.81 feet/day in a south-southwest direction. The transmissivity of the surficial aquifer was calculated at 156 ft²/day.

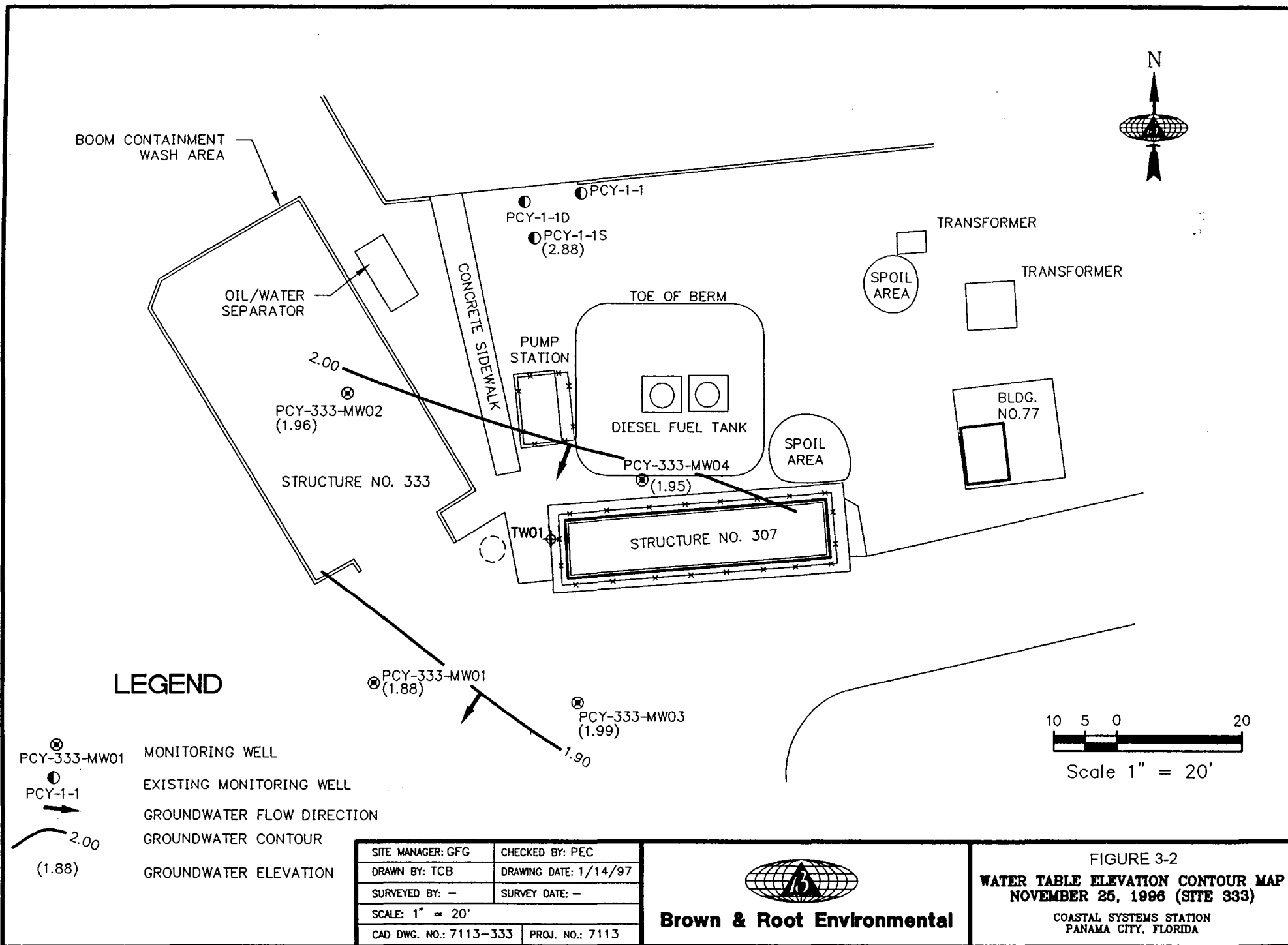
3.1.3 Tidal Influence

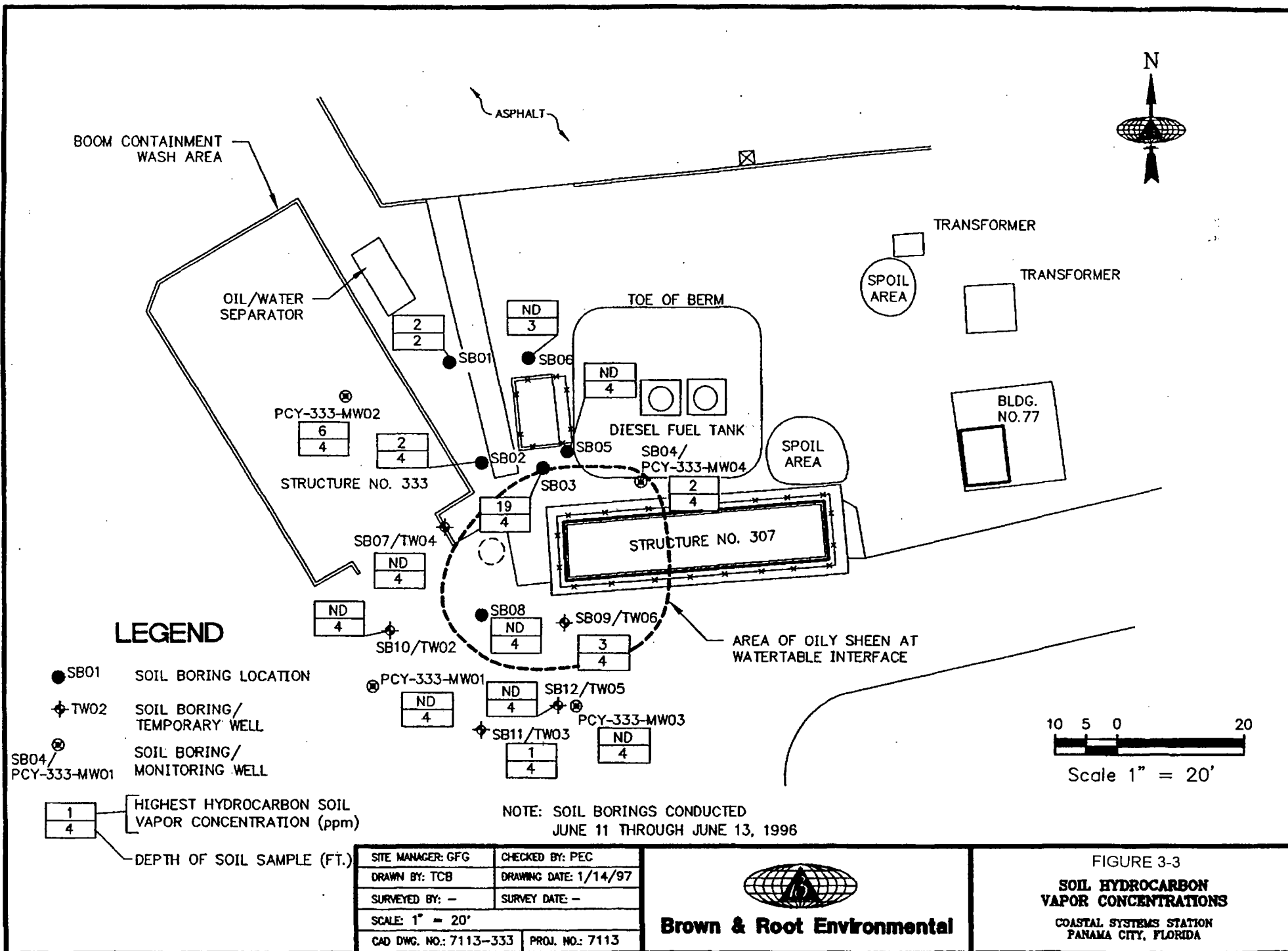
Results of the tidal survey conducted at monitoring wells PCY-14-5 and PCY-1-3 indicate groundwater fluctuations due to tidal influence is limited to a distance of less than 200 feet at SWMU 1 on Alligator Bayou. The distance in which significant tidal influence (that is, influence strong enough to affect groundwater flow) effects groundwater elevation is less than 40 feet from the bayou. This may be due to the presence of the sea wall at the bayou which may interfere with natural groundwater flow (ABB Environmental Services Inc., 1995).

3.2 SOIL QUALITY

The highest soil hydrocarbon vapor concentrations detected in vadose zone soils were 19 ppm and 6 ppm at boring locations SB03 and PCY-333-MW02, respectively. These samples were collected at a depth of 4 feet bls at the water table interface. No "excessively contaminated" soil as defined by Chapter 62-770.200, FAC was encountered in any of the soil samples. Soil vapor screening results are presented in Table 2-1. Soil boring locations and vapor readings are depicted on Figure 3-3.

Soil samples collected from the saturated zone at 4.5 feet to 5 feet bls at borings SB04, SB06, SB07, SB08, and SB09 exhibited an oil sheen with a fuel like odor. Soil analyses conducted on the soil at depths of 4 to 4.5 feet bls near the waste oil tank during the Tank Closure Assessment reported no volatile organic. Concentrations of 1-methynaphthalene, 2- methylnaphthalene, naphthalene, and TRPH were detected in the soil which are compounds characteristic of diesel fuel. No TCLP Volatiles or TCLP metals were detected in the composite soil sample collected from the "excessively contaminated soil". Soil laboratory analytical data sheets are included in the





Tank Closure Assessment provided in Appendix C.

3.3 WATER QUALITY

Results of field screening groundwater samples with a portable GC identified dissolved hydrocarbons at TW02 (SB10) and TW06 (SB11). The groundwater sample from TW02 reported toluene, ethylbenzene, and o-xylenes at concentrations of 3, 12, and 30 parts per billion (ppb), respectively. Groundwater in well TW06 contained benzene, toluene, ethylbenzene, m,p-xylenes, and o-xylenes at concentrations of 14, 23, 136, 43, and 169 ppb, respectively. Dissolved hydrocarbons were not detected in the groundwater sample collected from TW03 (SB11), TW04 (SB07), and TW05 (SB12). Based on the field screening water quality results, the locations for present monitoring wells PCY-333-MW01 and PCY-333-MW03 were selected to characterize groundwater quality near TW02 and TW06. TW02 and TW06 are located south and southwest of the oil/water separator. The field GC groundwater quality reports are provided in Appendix I.

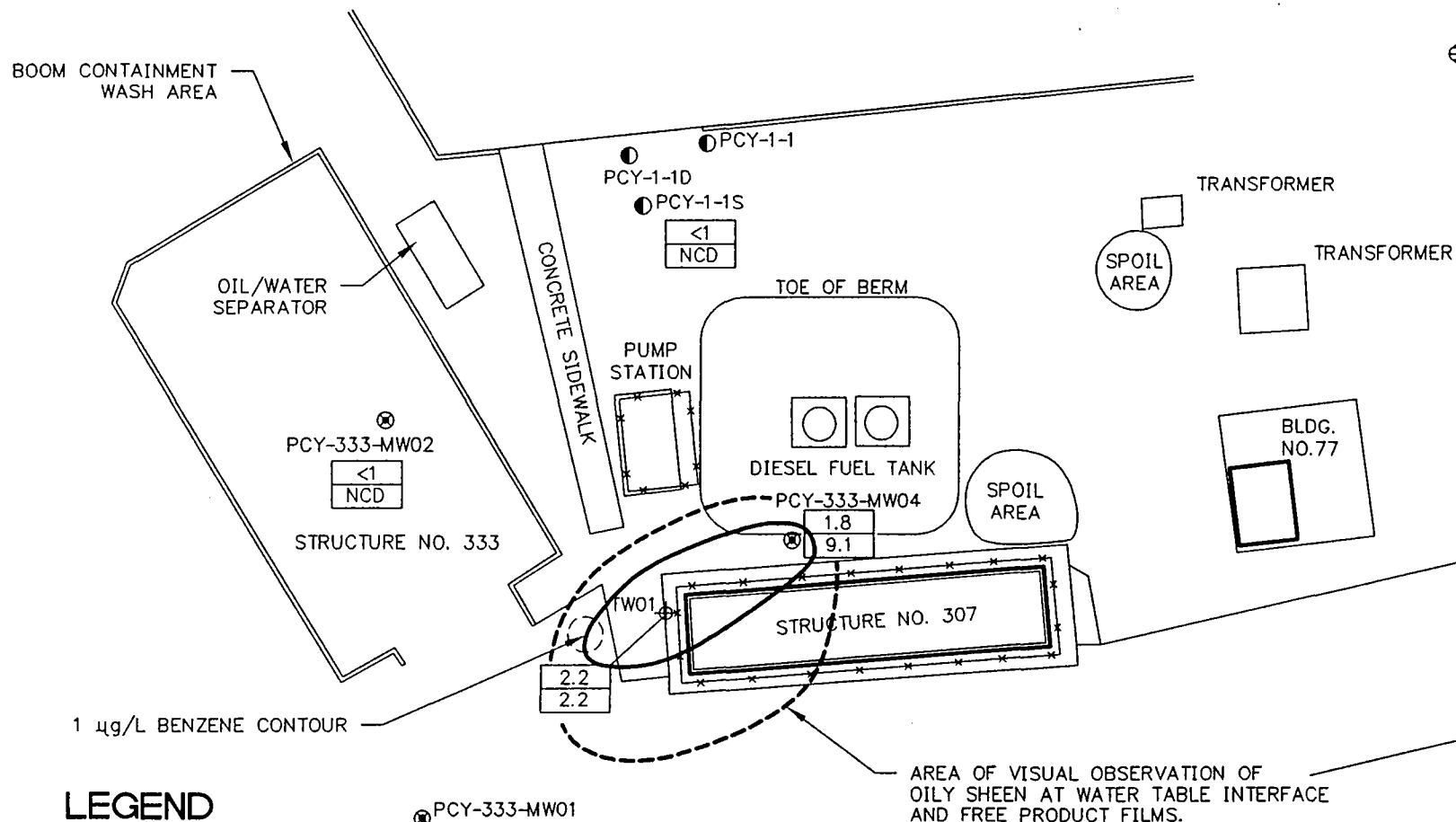
Water quality results of groundwater samples collected from site monitoring wells on July 11, 1996 and November 25, 1996 are summarized as follows:

Benzene was reported at 1.8 and 2.2 microgram per liter (ug/L) in monitoring wells PCY-333-MW04 and TW01, respectively. Benzene was reported below laboratory detection limits in all other groundwater samples. The concentrations of benzene reported in groundwater samples are slightly above the State Target Level 1 ug/L. Total VOA concentrations of 15 ug/L, 9.1 ug/L, and 2.2 ug/L were reported in wells PCY-333-MW02, PCY-333-MW04, and TW01, respectively. The concentrations of Total VOAs reported in groundwater samples are well below the State Action Level of 50 ug/L. Benzene and Total VOA groundwater concentrations are provided on Figure 3-4.

Volatile Organic Halocarbons were reported in groundwater samples collected in PCY-333-MW01 and TW01. Cis-1,2-dichloroethane was detected in PCY-333-MW01 at 1.8 ug/L. This concentration is below the Florida Primary Drinking Water Standard of 70 ug/L. Vinyl chloride was detected in TW01 at 1.4 ug/L. The Florida Primary Drinking Water Standard is 1.0 ug/L.

1,2-Dichloroethane, 1,2-dibromoethane (EDB), and volatile organics were reported below laboratory detection in all groundwater monitoring well samples.

NOTE: MONITORING WELLS PCY-1-1S, PCY-333-MW01, PCY-333-MW02 AND PCY-333-MW03 SAMPLED JULY 11, 1996. MONITORING WELLS PCY-333-MW04 AND TW01 SAMPLED NOVEMBER 25, 1996.



LEGEND

- PCY-333-MW01 MONITORING WELL
- PCY-1-1 EXISTING MONITORING WELL
- TW01 EXISTING TEMPORARY WELL
- <1 BENZENE CONCENTRATION (µg/L)
- NCD TOTAL VOA CONCENTRATION (µg/L)

10 5 0 20

Scale 1" = 20'

SITE MANAGER: GFG	CHECKED BY: PEC
DRAWN BY: TCB	DRAWING DATE: 1/14/97
SURVEYED BY: --	SURVEY DATE: --
SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



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FIGURE 3-4
**BENZENE AND TOTAL VOA
 CONCENTRATIONS IN GROUNDWATER**
 COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA

Naphthalene was reported below detection limits in all monitoring well samples. An elevated laboratory detection limit of <200 ug/l was used in the sample reporting of groundwater analysis from PCY-333-MW04. The reported total naphthalene concentration of 670 ug/L reported in this well maybe less than the actual total naphthalene concentration due to the elevated naphthalene detection limit. Prior to sampling well PCY-333-MW04, the well contained a free product thickness of 0.15 feet thickness of free product. Well PCY-333-MW04 is located adjacent to a diesel underground storage tank system (UST). Total Naphthalene was reported below detection limits in all other groundwater samples. The State Target Level for Total Naphthalene is 100 ug/l. Naphthalene and Total Naphthalene groundwater concentrations are shown on Figure 3-5.

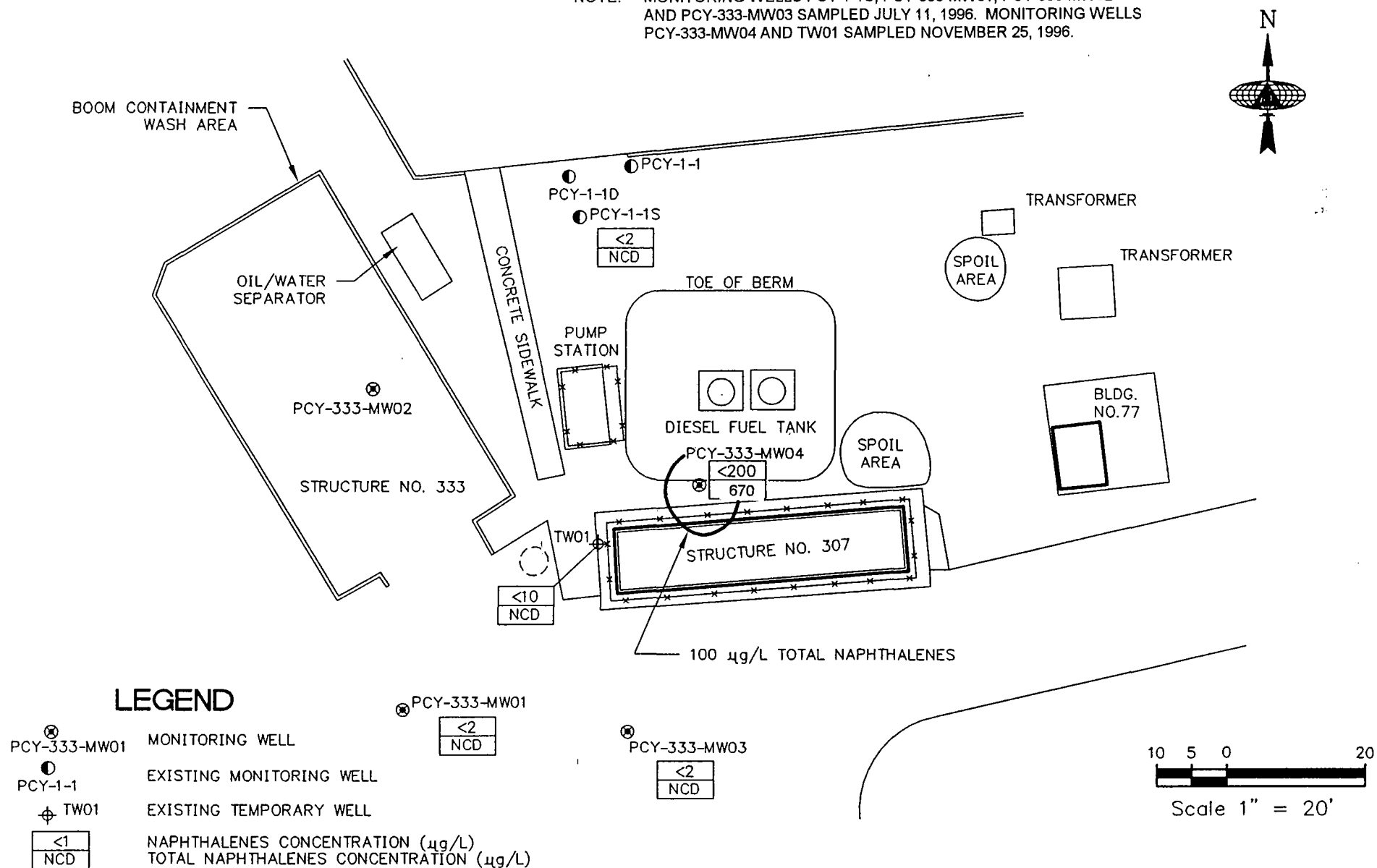
Semi volatile organics in groundwater were reported below laboratory detection limits in all monitoring well samples except PCY-333-MW04. Phenanthrene was reported in PCY-333-MW04 at 160 ug/L. Elevated laboratory detection limits were used in the reporting of groundwater quality results for PCY-333-MW04. The laboratory detection limits for the compounds analyzed in this sample generally ranged from <100 to <500 ug/L. Due to the elevated detection limits, other semi volatile organic compounds could exist in the groundwater at PCY-333-MW04 but were not detected. Phenanthrene is classified as a systemic toxicant under Florida Ground Water Guidance Concentrations. The guidance concentrations for Phenanthrene is 10 ug/L.

Arsenic and chromium were detected in several groundwater monitoring samples. The highest concentration of arsenic was detected in PCY-333-MW03 at 4.0 ug/L. The highest concentration of chromium was reported in PCY-333-MW01 at 21.4. The State Target Levels for arsenic and chromium are both 50 ug/L. Cadmium was reported below laboratory detection limits in all groundwater monitoring well samples.

Groundwater lead concentrations were reported below the State Action Level of 50 ug/L in all wells except PCY-333-MW02. Concentrations of lead were detected in PCY-333-MW03 at 142 and 677 ug/L during the July and November sampling events. PCY-333-MW02 is located within the landfill area of SWMU 1. During installation of the well, rusted metal objects were encountered at the water table which could be contributing to the elevated lead concentrations at the well location. Lead concentrations in groundwater samples collected in other monitoring wells at Site 333 ranged from 0.95 to 20.6 ug/L, as shown on Figure 3-6.

TRPH concentrations were reported in several wells. The highest concentrations were reported in groundwater samples from TW01 and PCY-333-MW04 at concentrations of 19.2 and 21.5

NOTE: MONITORING WELLS PCY-1-1S, PCY-333-MW01, PCY-333-MW02 AND PCY-333-MW03 SAMPLED JULY 11, 1996. MONITORING WELLS PCY-333-MW04 AND TW01 SAMPLED NOVEMBER 25, 1996.



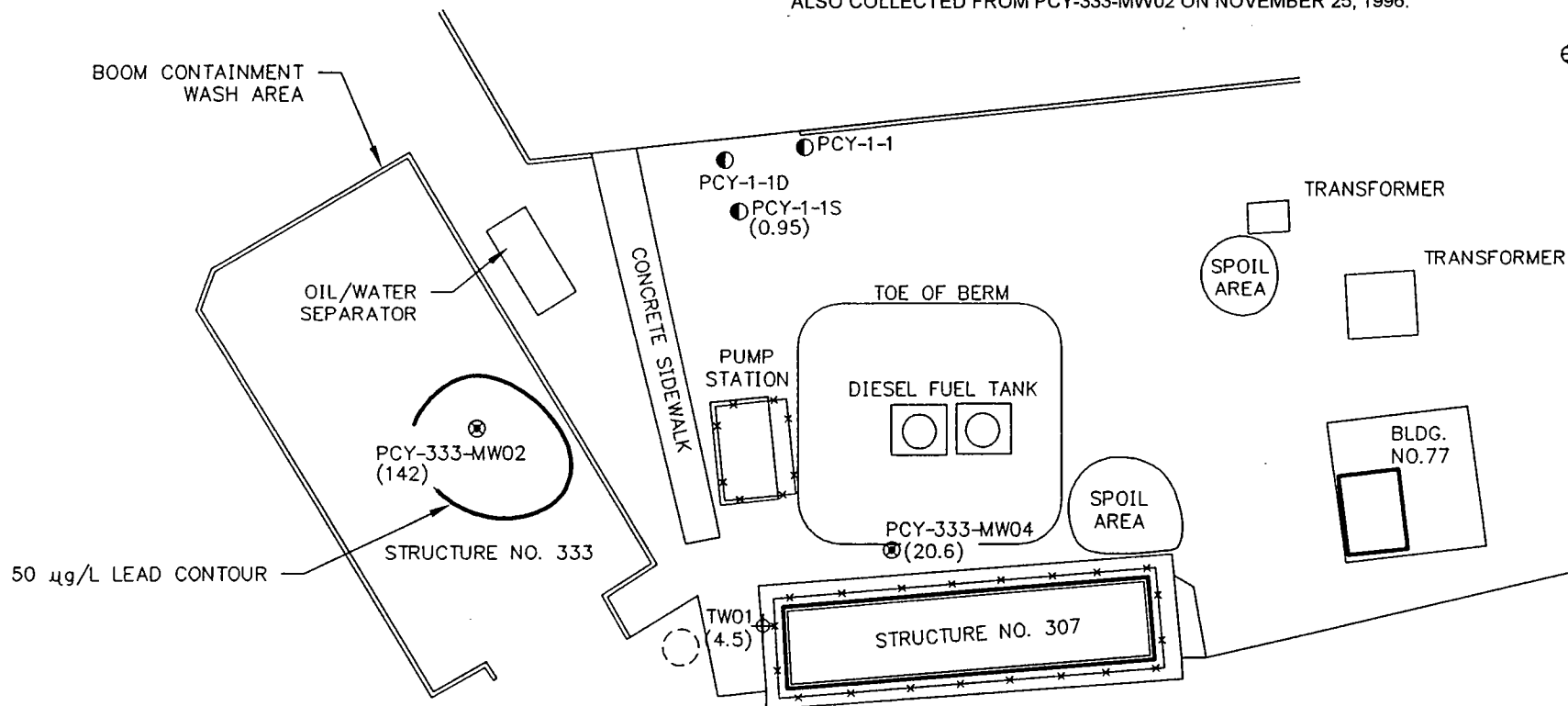
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DRAWN BY: TCB	DRAWING DATE: 1/14/97
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SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



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FIGURE 3-5
**NAPHTHALENE & TOTAL NAPHTHALENE
 CONCENTRATIONS IN GROUNDWATER**
 COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA

NOTE: MONITORING WELLS PCY-1-1S, PCY-333-MW01, PCY-333-MW02 AND PCY-333-MW03 SAMPLED JULY 11, 1996. MONITORING WELLS PCY-333-MW04 AND TW01 SAMPLED NOVEMBER 25, 1996. LEAD SAMPLE ALSO COLLECTED FROM PCY-333-MW02 ON NOVEMBER 25, 1996.



LEGEND

- ⊗ PCY-333-MW01 MONITORING WELL
- PCY-1-1 EXISTING MONITORING WELL
- ⊕ TW01 EXISTING TEMPORARY WELL
- (7.0) LEAD CONCENTRATION ug/L
- [677] LEAD CONCENTRATION REPORTED FROM NOVEMBER 25, 1996 SAMPLING EVENT

⊗ PCY-333-MW01 (16.9)

⊗ PCY-333-MW03 (7.0)



Scale 1" = 20'

SITE MANAGER: GFG	CHECKED BY: PEC
DRAWN BY: TCB	DRAWING DATE: 1/14/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



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FIGURE 3-7

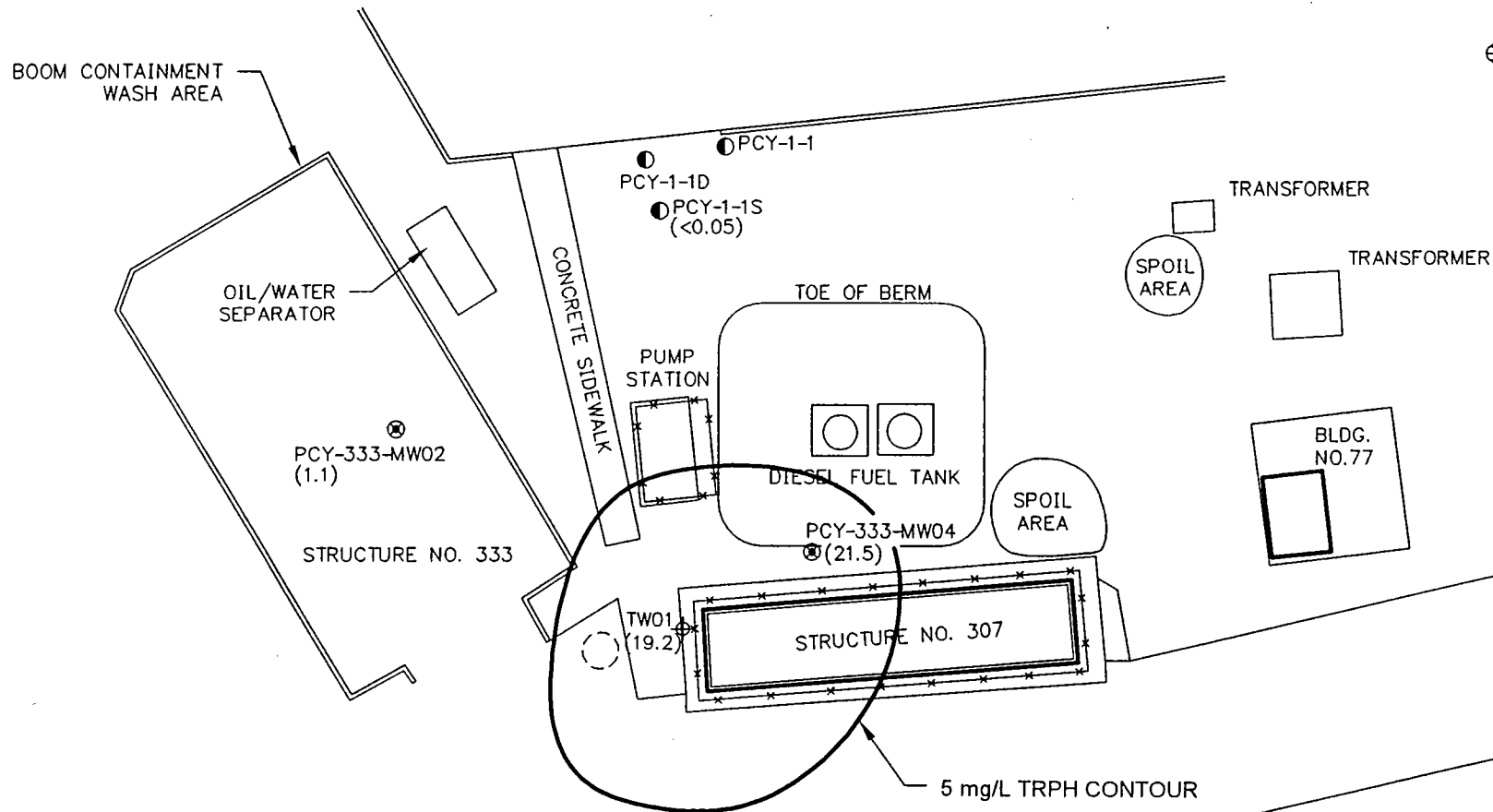
TOTAL LEAD CONCENTRATIONS IN GROUNDWATER

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

milligrams per liter (mg/L). These concentrations exceed the State Action level of 5 mg/L. TRPH groundwater concentrations are provided in Figure 3-7.

Toluene was reported in the Equipment Blank sample at 1.4 ug/L for samples collected on July 7, 1996. The detection of this constituents was at a level which did not effect the interpretation of the data and the water quality data is considered acceptable. The Equipment Blank sample collected on November 25, 1996 reported trace amounts of MTBE and lead. This constituents were reported at levels were which did not effect the interpretation of the data. A summary of groundwater analytical results are presented in Table 3-2. Groundwater laboratory analytical results are provided as Appendix J. Field sampling forms are included in Appendix H.

NOTE: MONITORING WELLS PCY-1-1S, PCY-333-MW01, PCY-333-MW02 AND PCY-333-MW03 SAMPLED JULY 11, 1996. MONITORING WELLS PCY-333-MW04 AND TW01 SAMPLED NOVEMBER 25, 1996.



LEGEND

- ⊗ PCY-333-MW01 MONITORING WELL
- PCY-1-1 EXISTING MONITORING WELL
- ⊕ TW01 EXISTING TEMPORARY WELL
- (0.08) TRPH CONCENTRATION (mg/L)

10 5 0 20
Scale 1" = 20'

SITE MANAGER: GFG	CHECKED BY: PEC
DRAWN BY: TCB	DRAWING DATE: 1/14/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



Brown & Root Environmental

FIGURE 3-6
TRPH CONCENTRATIONS
IN GROUNDWATER
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

TABLE 3-2
SUMMARY OF GROUNDWATER QUALITY:
SELECTED PARAMETERS FROM THE GASOLINE AND KEROSENE
ANALYTICAL GROUP
Site 333
Coastal Systems Station, Panama City, Florida
FDEP ID No. 038518667

Monitoring Well ID	Date Sampled	Benzene (µg/L)	Total VOA (µg/L)	MTBE (µg/L)	DCE (µg/L)	EDB (µg/L)	NAP (µg/L)	Total NAPS (µg/L)	TRPH (mg/L)	Volatile Organics (µg/L)	Semi Volatile Organics (µg/L)	Arsenic Unfiltered Samples (µg/L)	Cadmium Unfiltered Samples (µg/L)	Chromium Unfiltered Samples (µg/L)	Lead Unfiltered Samples (µg/L)
PCY-1-1S	7/11/96	<1.0	<1.0	<1.0	<1.0	<0.02	<2	NCD	<0.05	NCD	NCD	2.2	<3.3	<2.2	0.95
PCY-333-MW01	7/11/96	<1.0	15	9.0	<1.0 *(1)	<0.02	<2	NCD	0.08	NCD	NCD	2.9	<3.3	21.4	16.9
PCY-333-MW02	7/11/96 11/25/96	<1.0 NA	<1.0 NA	<1.0 NA	<1.0 NA	<0.02 NA	<2 NA	NCD NA	1.1 NA	NCD NA	NCD NA	3.7 NA	<3.3 NA	11.6 NA	142 677
PCY-333-MW03	7/11/96	<1.0	<1.0	<1.0	<1.0		<2	NCD	<0.05	NCD	NCD	2.6	<3.3	7.5	5.8
PCY-333-MW03 (Duplicate Sample)	7/11/96	<1.0	<1.0	<1.0	<1.0	<0.02	<2	NCD	<0.05	NCD	NA	4.0	<3.3	8.9	7.0
PCY-333-MW04	7/11/96 11/25/96	NA 1.8	NA 9.1	NA <1.0	NA <1.0	NA <0.02	NA <200	NA 670	NA 21.5	NA NCD	NA 160 ⁽²⁾	NA <1.6	NA <3.3	NA 3.0	NA 20.6
TW01	7/11/96 11/25/95	NA 2.2	NA 2.2	NA <1.0	NA *(3)	NA <0.02	NA <10	NA NCD	NA 19.2	NA NCD	NA NCD	NA 1.8	NA <3.3	NA <2.2	NA 4.5
Trip Blank	7/11/96 11/25/96	<1.0 NA	1.8 NA	<1.0 NA	<1.0 NA	NA NA	NA NA	NA NA	NA NA	NCD NA	NA NA	NA NA	NA NA	NA NA	NA NA
Equipment Blank	7/11/96 11/25/96	<1.0 <1.0	1.4 <1.0	<1.0 1.3	<1.0 <1.0	<0.02 <0.02	<2 <2	NCD NCD	<0.05 <0.06	NCD NCD	NCD NCD	<0.95 <1.6	<3.3 <3.3	<2.2 <2.2	<0.75 1.4

Notes:

- (1) = cis-1,2-dichloroethene detected at 1.8 ug/L
(2) = phenanthrene detected at 160 ug/L (elevated detection limit)
(3) = vinyl chloride detected at 1.4 ug/L (DEC reported at <1.0 ug/L)
ID = identification
ug/L = micrograms per liter
NA = not analyzed
Total VOA = total volatile organic aromatics = sum of benzene, toluene, ethylbenzene, and xylenes
MTBE = methyl tert-butyl ether
DCE = 1,2-dichloroethane
EDB = 1,2-dibromoethane = ethylene dibromide
NCD = no constituents detected
TRPH = total petroleum hydrocarbons
NAP = naphthalene
Total NAPS = sum of total naphthalene constituents detected in sample

4.0 DISCUSSION

In November 1995, approximately 2 cubic yards of "excessively contaminated" soil was removed during an oil/water system upgrade for the boom containment wash area. The "excessively contaminated" soil was from an excavation to remove the waste oil tank used as part of the oil/water system collection system. During June 1996, B&R Environmental conducted a soil vapor survey in the area of the former oil/water separator. "Excessively contaminated" soil was not encountered within the vadose zone soils during the assessment. The removal of the "excessively contaminated" soil from the vadose zone, appears to have been completed during excavation of soils in November 1995.

Samples of the oil stained soil collected during the Tank Closure Assessment reported no volatile organics in the soil. Semi volatile organic constituents with diesel fuel composition (naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene) were reported in the soil sample collected at 4.5 feet bls. The presence of these constituents suggests soil contamination is attributed to a diesel fuel release. TRPH was also detected in the soil analyses indicating the source of contamination is petroleum in nature. No TCLP volatiles or TCLP metals were detected in the composite soil sample collected from the "excessively contaminated" soil pile to indicate the soil is hazardous.

During the soil vapor assessment, oil stained soils were identified at several boring locations near the waste oil tank. The oil stained soils were identified in soil samples collected at the water table interface at 4.5 to 5 feet bls. Oily saturated soil and free product was also detected at monitoring well location PCY-333-MW04. Well PCY-333-MW04 is located upgradient of groundwater flow to the waste oil tank and downgradient of flow to the diesel underground storage tanks which are located approximately 25 feet northeast of the waste oil tank. It is therefore unlikely that the contamination in well PCY-333-MW04 is unrelated to Site 333.

Laboratory analysis of groundwater samples collected during the CA indicate dissolved hydrocarbon concentrations above State Action Levels for benzene, total VOAs, naphthalene, total naphthalene, TRPH, and lead. The benzene, total VOAs, naphthalene, total naphthalene, and TRPH dissolved plume concentrations appear to be limited to the southeast area of the diesel UST, and the area where excessively contaminated soils were excavated during the tank closure assessment. These plume areas also correlate with the area where visual observation of oil stained soils were identified.

The oil stained soils at the water table interface appear to be from old spills which occurred at the diesel UST. The diesel UST is located directly upgradient of the underground waste oil tank. The lateral dispersion of the oil-stained soils at the water table interface, and the low concentrations of dissolved hydrocarbons detected in groundwater samples collected from site monitoring wells (other than source well PCY-333-MW04), suggests the product is heavily weathered.

Vinyl chloride and cis-1,2,-dichloroethane were detected at concentrations slightly above laboratory detection limits. The source for these constituents is unknown and is likely unrelated to Site 333.

Monitoring well PCY-333- MW02 reported elevated levels of lead above State Action Levels. The elevated lead at this location may have been caused by the disposal of scrap metal in SWMU-1. Rusted objects were encountered during the installation of the well which may have elevated the lead concentration in that well.

Based on petroleum hydrocarbon concentrations detected in monitoring wells downgradient of the site, Alligator Bayou does not appear to be threatened from the levels of hydrocarbons detected at the site.

The predominant soil type of the surficial aquifer is composed of sand. A sandy clay and clayey sand deposit was identified at a depth of 27 to 35 feet bls at monitoring well location PCY-1-1D. Well PCY-1-1D is located approximately 50 feet north of the waste oil tank. These fine grained deposits would have lower permeability than the overlying sand and should help attenuate the downward migration of petroleum hydrocarbons.

Depth to water to the surficial aquifer (water table) has been documented at approximately 4.5 to 5 feet bls. Subsurface utilities identified at the site which could potentially intersect the water table include a water main and sanitary sewer line. These utilities are typically completed at depths of 4 feet bls. These utilities are located up gradient of the dissolved contaminant plume identified at the waste oil tank and diesel tank area and should not provide a pathway for the transport of dissolved constituents in the subsurface. The direction of groundwater flow for the surficial aquifer is towards the southwest toward Alligator Bayou. The groundwater flow velocity was calculated at 1.18 feet/year.

The effects of tidal influence on the groundwater flow direction at the site is negligible. A sea wall constructed at Alligator Bayou restricts the natural flow of groundwater in the area and limits the effects of tidal influence. Alligator Bayou acts as the natural discharge point for the water table aquifer downgradient of the site. However, the seawall does create a vertical component of groundwater flow as groundwater which normally discharges to the bayou tries to flow under and/or along the seawall.

The well fields and surface water intakes which supply drinking water to the local area are located outside a 0.50-mile radius of the site. Domestic water wells were not identified within 0.25-mile of the site. Therefore, the water supply for the area has not been impacted by Site 333.

5.0 CONCLUSIONS AND RECOMMENDATION

The results of B&R Environmental's CA at CSS Site 333 suggest the following:

- Groundwater in the surficial aquifer at the site has a G-II classification;
- Private potable water wells were not identified within 0.25-mile radius of the site;
- Municipal well fields and surface water intakes were not identified within a 0.50-mile radius of the site;
- Analysis of soil samples collected during the Tank Closure Assessment indicate the soils are not hazardous.
- Excessively contaminated soil in vadose soils was not encountered during the CA;
- Oil stain soils identified at the water table surface appear to be from heavily weathered diesel;
- Free product was measured at a thickness of 0.15 foot in well PCY-333-MW04;
- The source of dissolved hydrocarbons appears to be from old spills which occurred at the diesel UST located adjacent to Site 333;
- Analysis of groundwater samples show the benzene, total VOAs, EDB, arsenic, cadmium, chromium, total naphthalene, and 1-2-dichloroethane constituents were reported at concentrations below the State Action Level for No Further Action (NFA) criteria for a G-II aquifer without wells (FDEP, 1990) (Table 5-1). Concentrations of total naphthalene, lead, vinyl chloride, phenanthrene, and cis-1,2-dichloroethane were reported at levels which meet State Action Levels for Monitoring Only status for G-II aquifers without wells.

Based upon the hydrogeological and chemical data presented in this CAR, and the CA criteria for Monitoring Only, the site qualifies for Monitoring Only status. However, we believe prior to developing a Monitoring Only Plan, an Alternate Remedial Procedure should be performed in an attempt to reduce concentration levels of naphthalene, total naphthalene, and TRPH, in source wells TW01 and PCY-333-MW01. The Alternative Remedial Procedure would also address reducing the lead concentration in PCY-333-MW02. An Alternative Remedial Procedure applied to this site may be effective at reducing the constituents in the groundwater to NFA levels or reduce the required monitoring period. A Remedial Action Procedure will be prepared and submitted to the FDEP upon review and approval of this Contamination Assessment Report.

TABLE 5-1
MAXIMUM ACCEPTABLE GROUNDWATER CONSTITUENT LEVELS
Site 333
Coastal Systems Station, Panama City, Florida
FDEP Facility No. 038518667

Analyte or Analytical Method	Highest Ground Water Constituent Level in Site Monitoring Wells	No Further Action		Monitoring Only			
		G-II Aquifer	G-II Aquifer	G-II Aquifer with wells		G-II Aquifer without wells	
		(with wells)	(without wells)	source	perimeter	source	perimeter
Total BTEX	15	50	50	500	50	1000	50
Benzene	2.2	1	50	250	1	500	50
TRPH	21.5	5^	5^	50^	5^	100^	5^
Lead	677	50	50	500	50	1^	50
EDB	<0.02	0.02	0.02	0.02	0.02	0.4	0.02
Total Naphs	670	100	100	1000	100	2000	100
EPA 610	<4 to<200	DL	DL	10xDL	DL	20xDL	DL
EPA 601	<1.8	DW-SRLs	DW-SRLs	10xDW-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
Arsenic	4.0	50	50	500	50	1^	50
Cadmium	<3.3	10	10	100	10	200	10
Chromium	21.4	50	50	500	50	1^	50
EPA 624	NCD	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs
EPA 625	160	DW-SRLs	DW-SRLs	10xDL-SRLs	DW-SRLs	20xDW-SRLs	DW-SRLs

Notes:

All data in µg/L unless otherwise noted

^ data in mg/L

Source: Monitoring wells near suspected hydrocarbon source
Perimeter: Monitoring wells located at perimeter of plume
TRPH: Total Recoverable Petroleum Hydrocarbons
Total Naphs: Sum of naphthalenes and methylnaphthalenes
DW-SRLs: Drinking Water Standards or Applicable Site Rehabilitation Levels
DL: Detection Limit
NCD No Constituents Detected

6.0 REFERENCES

ABB Environmental Services, Inc., 1995, RCRA Facility Investigation, Coastal Systems Station Panama City, Florida.

Florida Department of Environmental Protection, October 1990. *No Further Action and Monitoring Only Guidelines for Petroleum Contaminated Sites*, Bureau of Waste Cleanup, Technical Review Section.

Heath Ralph C., 1983, Basic GroundWater Hydrology: US Geological Survey Water Supply Paper 2220.

NAVFAC Drawing No. 504-6560, Oil Spill Control Equipment Clean-Up Wash Rack Plan & Details, August 1, 1978.

Southern Waste Services Environmental First Response, 1996, Closure Assessment Report FAC. #333 Waste Oil & Oil/Water Separator, Coastal Systems Station, Panama City, Florida.

U.S. Geological Survey, Panama City, FLA., Quadrangle 1982. 7.5 minute series, Topographic Quadrangle Maps of Florida: scale 1:24,000.

U.S. Geological Survey. Panama City Beach, FLA., Quadrangle 1982. 7.5 minute series, Topographic Quadrangle Maps of Florida: scale 1:24,000.

APPENDIX A

**DISCHARGE NOTIFICATION FORM AND INITIAL REMEDIATION ACTION
NOTIFICATION FORM**



DEPARTMENT OF THE NAVY
COASTAL SYSTEMS STATION DAHLGREN DIVISION
NAVAL SURFACE WARFARE CENTER
6703 WEST HIGHWAY 98
PANAMA CITY FL 32407-7001

IN REPLY REFER TO:

5090
Ser 051E/225

1 DEC 1995

Pollutant Storage Tank Program
Attn: Mr. Dennis D. Pinkovsky, Ph.D.
619 North Cove Boulevard, Suite C
Panama City, FL 32401

Dear Mr. Pinkovsky:

The Discharge Reporting Form provided as enclosure (1) is forwarded as required to report our discovery of contaminated soil during the removal of NSWCCSS waste oil tank #333.

Enclosure (2) is provided for the remedial action we initiated in an attempt to remove all of the excessively contaminated soil. After initiation of the remedial action we concluded from the extent and direction of contamination that the source was not from this tank. It was most likely from an adjacent contaminated site known as Solid Waste Management Unit #1. This adjacent site is an area once used as the NSWCCSS landfill in the late 1940's and early 1950's. It is presently under investigation for possible corrective action under the Navy's Installation Restoration Program. Based on our conclusion we immediately stopped our attempts to remediate the site.

Enclosure (3) is a tank registration update being provided for our removal of this waste oil tank.

If you require additional information at this time, please contact Mr. Mike Clayton, Code 051EMC, at (904) 235-5859 or Mr. Bill Logsdon, Code 051EBL, at (904) 235-5474.

Sincerely,

D. L. GREEN
Assistant Public Works Officer
By direction of
the Commanding Officer

Encl:

- (1) FDEP Form 17-761.900(1)
- (2) Initial Remedial Action Notification
- (3) FDEP form 17-761.900(2)

Copy to:

FDEP (Mr. Eric Nuzie)
NAS Jacksonville (Mr. Jerry Wallmeyer)



Form Title	Discharge Reporting Form
Effective Date	December 10, 1990
DER Application No.	(Filed in by DER)

Discharge Reporting Form

Use this form to notify the Department of Environmental Regulation of:

1. Results of tank tightness testing that exceed allowable tolerances within ten days of receipt of test result.
2. Petroleum discharges exceeding 25 gallons on pervious surfaces as described in Section 17-761.460 F.A.C. within one working day of discovery.
3. Hazardous substance (CERCLA regulated), discharges exceeding applicable reportable quantities established in 17-761.460(2) F.A.C., within one working day of the discovery.
4. Within one working day of discovery of suspected releases confirmed by: (a) released regulated substances or pollutants discovered in the surrounding area, (b) unusual and unexplained storage system operating conditions, (c) monitoring results from a leak detection method or from a tank closure assessment that indicate a release may have occurred, or (d) manual tank gauging results for tanks of 550 gallons or less, exceeding ten gallons per weekly test or five gallons averaged over four consecutive weekly tests.

Mail to the DER District Office in your area listed on the reverse side of this form

PLEASE PRINT OR TYPE
Complete all applicable blanks

1. DER Facility ID Number: 038518667 2. Tank Number: 333 3. Date: 11/28/95
4. Facility Name: Coastal Systems Station
Facility Owner or Operator: United States Navy
Facility Address: Code 051E, 6703 W Hwy 98, Panama City, FL 32407-7001
Telephone Number: (904) 235-5859 County: BAY
Mailing Address: Same as Above
5. Date of receipt of test results or discovery: 11/28/95 month/day/year
6. Method of initial discovery. (circle one **only**)
A. Liquid detector (automatic or manual) B. Vapor detector (automatic or manual) C. Tightness test (underground tanks only).
D. Emptying and Inspection. E. Inventory control. F. Vapor or visible signs of a discharge in the vicinity.
G. Closure: System Removal (explain)
H. Other: _____
7. Estimated number of gallons discharged: UNKNOWN
8. What part of storage system has leaked? (circle all that apply) A. Dispenser B. Pipe C. Fitting D. Tank E. Unknown
9. Type of regulated substance discharged. (circle one)
A. leaded gasoline B. unleaded gasoline C. gasohol D. vehicular diesel E. aviation gas F. jet fuel G. used/waste oil H. diesel I. new/lube oil V. hazardous substance includes pesticides, ammonia, chlorine and derivatives (write in name or Chemical Abstract Service CAS number) _____
Z. other (write in name) _____
10. Cause of leak. (circle all that apply)
A. Unknown B. Split C. Loose connection D. Corrosion E. Puncture F. Installation failure G. Spill H. Overfill I. Other (specify) _____
11. Type of financial responsibility. (circle one)
A. Third party insurance provided by the state insurance contractor B. Self-insurance pursuant to Chapter 17-769.500 F.A.C. C. Not applicable D. None
2. To the best of my knowledge and belief all information submitted on this form is true, accurate, and complete.

W. A. OSTER, LCDR, USN

Signature of Owner, Operator, or Authorized representative

Northwest District
160 Governmental Center
Panama City, Florida 32501-5734
904-436-8300

Northeast District
7825 Baymeadows Way, Suite B 200
Jacksonville, Florida 32207
904-796-4200

Central District
3319 Maguire Blvd. Suite 212
Orlando, Florida 32803-3787
407-894-7555

Southwest District
4520 Oak Fair Blvd.
Tampa, Florida 33610-7347
813-623-5581

South District
2268 Bay St.
Fort Myers, Florida 33901-2896
813-332-6975

Southeast District
1900 S. Congress Ave., Suite A
West Palm Beach, Florida 33408
407-433-2650

ENCL (1)

INITIAL REMEDIAL ACTION NOTIFICATION FORM

This notification provides written confirmation of initial remedial action (IRA) as required by Chapter 17-770.300(5) and (8), Florida Administrative Code. Notification must be within three working days of initiation of an IRA. The notification must be submitted to the appropriate contracted local program and/or:

Florida Department of Environmental Protection
Bureau of Waste Cleanup
Engineering Support Section
2600 Blair Stone Road
Tallahassee, FL 32399-2400
(904) 488-3935

Upon completion of the IRA program task, an Initial Remedial Action Report (or its equivalency) should be submitted for technical review.

I. FACILITY NAME: COASTAL SYSTEMS STATION

Facility Address: Code 051E, Coastal Systems Station, 6703 W Hwy 98, Panama City
FL 32407-7001

DER Facility Number (if applicable): 038518667

Date IRA Initiated: 11/28/95 Date IRA Completed: 11/28/95

II. FREE PRODUCT RECOVERY

A. Type(s) of Product Discharged: N/A

B. Quantity

1. Estimated Gallons Lost: N/A

C. Method of Product Recovery: N/A

D. Type of Discharge During Product Recovery: N/A

E. Type of Treatment, i.e., Oil/Water Separator: and Expected
Effluent Quality from Any Discharge: N/A

F. Quantity and Disposal of Recovered Product: N/A

III. SOIL EXCAVATION

- A. Estimated Volume of Excessively Contaminated Soil Excavated in Cubic Yards: 2 CY
- B. Estimated Dimensions of Excavation Including Depth of Excavation(s): 12' long x 9' wide x 5' deep
- C. Type(s) of Product in Soil: Waste Petroleum (old)
- D. Type of Instrument and Method Used to Determine Excessive Soil Contamination: Organic Vapor Analyzer (OVA) Instrument with a Flame Ionization Detector (FID). Samples were screened with and without a carbon filter

IV. ADDITIONAL COMMENTS: Initial remediation could not remediate all excessively contaminated soil due to the location and extent of contamination discovered. The contamination appears to not have been created by this oily waste management system but may be that of an adjacent contaminated site being investigated in the Navy's Installation Restoration Program.

MICHAEL D CLAYTON
Print Person Completing Form

Michael D. Clayton 12/01/95 NSWCCSS Public Works Environmental Engineer
Signature Date Title, Affiliation
Coastal Systems Station
Code 051E
6703 W Hwy 98, Panama City, FL 32407-7001
Company Address

(904) 235-5859
Phone Number



Storage Tank Registration Form

Please Print or Type - Review Instructions Before Completing Form

1. DER Facility ID Number: 038518667 2. Facility Type: (F) Federal
3. New Registration ☐ New Owner Data ☐ Facility Revision ☐ Tank(s) Revision ☒
4. County and Code of tank(s) location: BAY / 03

5. Facility Name: Coastal Systems Station
Tank(s) Address: 6703 West Hwy 98
City/State/Zip: Panama City FL 32407-7001
Contact Person: Mike Clayton Code 0511 Telephone: (904) 235-5859
6. Financial Responsibility Type: C

- 7a. Tank(s) Owner: U. S. Navy (Coastal Systems Station)
Owner Mailing Address: 6703 West Hwy 98
City/State/Zip: Panama City FL 32407-7001
Contact Person: Mike Clayton Telephone: (904) 235-5859

- 7b. New Owner Signature/Change Date: N/A / 11/28/95

8. Location (optional) Latitude: ° ' " Longitude: ° ' " Section _____ Township _____ Range _____

Complete One Line For Each Tank At This Facility (Use Codes - See Instructions)

Complete 9 - 16 for tanks in use; 9 - 19 for tanks out of use

9	10	11	12	13	14	15	16	17	18	19
333	550	L	XX/79	U	E	B	X	B	0	11/28/95

20. Thickston Bros. Inc
Certified Contractor*

DPR# PCC 049522
Department of Professional Regulation License Number

*For new tank installation or tank removal

To the best of my knowledge and belief all information submitted on this form is true, accurate and complete.

for
W. A. OSTER, LCDR, USN, PWO OFFICER
Print name & title of owner or authorized person

Donald Green
Signature

12/1/95
Date

APPENDIX B
CAR SUMMARY SHEET

Facility Name: Coastal Systems Station
Location: Panama City, Florida
EDI #: _____ FAC I.D. #: 038518667

Reimbursement Site ☐
State Contract Site ☐
Other: ☒

oil/water separator, waste oil tank
(1) Source of spill: diesel tank Date of spill: unknown

(2) Type of product: gasoline group gasoline lost kerosene group gallons lost
☐ leaded _____ ☐ kerosene _____
☐ unleaded regular _____ ☒ diesel unknown
☐ unleaded premium _____ ☐ JP-6 Jet fuel _____
☐ gasohol _____ ☐ Jet A fuel _____

(3) Description of IRA (if any): Soils excavated
From waste oil tank pit
☐ Free product removal: 4 1/8 (gals)
☒ Soil removal: 2 (cubic yds)
☐ Soil incineration: _____ (cubic yds)

(4) Free product still present? (yes/no) Maximum apparent product thickness: 0.15 (ft)
(5) Maximum groundwater Total VOA: 15 benzene: 2.2 EDB: 0.02
contaminant levels (ppb): Lead: 677 MTBE: 9 other: TRPH
Total Naphthalene: 670, Cis-1,2-dichloroethane: 1.8
Vinyl chloride: 1.4 Phenanthrene: 160

(6) Brief lithologic description: _____

(7) Areal and vertical extent of soils contamination defined? (yes/no)
High current soil concentration (OVA: 19 ppm) or (EPA Method 5030/8020: _____ ppm)
(8) Lower aquifer contaminated? (yes/no) Depth of vertical contamination: Vertical Extent will not be installed
Site Sampled 7/11/96 and
(9) Date of last complete round of groundwater sampling: 11/25/96 Date of last soil sampling: _____
(10) QAPP approved? (yes/no) Date: 6/16/96
(11) Direction (e.g. NNW) of surficial groundwater flow: South-Southwest (Figure 3-1 on page 3-4)
(12) Average depth of groundwater: 4.5 to 5 (ft)
(13) Observed range of seasonal groundwater fluctuations: 1.45 (ft) (well PCY-1-15)
(14) Estimated rate of groundwater flow: 1.18 (ft/day)
(15) Hydraulic gradient across site: 0.05 (ft/ft)

Aquifer characteristics:	Value	Units	Methods
Hydraulic conductivity	<u>7.1</u>	<u>ft/day</u>	<u>slug test data</u>
Storage coefficient	<u>-</u>	<u>-</u>	<u>-</u>
Aquifer thickness	<u>22</u>	<u>ft</u>	<u>Depth to water subtracted from depth to top of sandy clay unit</u>
Effective soil porosity	<u>.30</u>	<u>-</u>	<u>Literature value</u>
Transmissivity	<u>156</u>	<u>ft²/day</u>	<u>T = Kb</u>

(17) Other remarks: Solid Waste Management Unit 1 and diesel tank located
upgradient of waste oil tank. Diesel tank source for
old product observed at water table/soil interface.

APPENDIX C

TANK CLOSURE ASSESSMENT



DEPARTMENT OF THE NAVY
COASTAL SYSTEMS STATION DAHLGREN DIVISION
NAVAL SURFACE WARFARE CENTER
6703 WEST HIGHWAY 98
PANAMA CITY FL 32407-7001

IN REPLY REFER TO:

5090
Ser 051E/027

06 MAR 1996

Pollutant Storage Tank Program
Attn: Mr. Dennis D. Pinkovsky, Ph.D.
HRS Environmental Health Services
619 North Cove Boulevard, Suite C
Panama City, FL 32401

Dear Mr. Pinkovsky:

Enclosure (1) is provided regarding the excavation and removal of the underground waste oil tank #333 and the oil/water separator associated with the Coastal Systems Station (NSWCCSS) Spill Containment Boom wash area, facility #333.

Petroleum contaminated soils discovered during the excavation were verified by using an Organic Vapor Analysis. Initial remediation began but soon stopped as it was evident the amount of remediation needed would greatly exceed the scope of work identified in the tank removal contract. The initial remedial action report will soon follow once disposal of the contaminated soil has been completed.

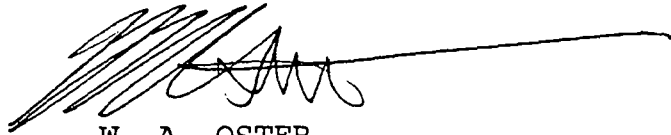
NSWCCSS will be using the services of Brown and Root Environmental, a Division of Brown & Root, Inc., through a contract with the Naval Facilities Engineering Command, Southern Division, to conduct the petroleum contamination assessment. This contamination assessment will be conducted in accordance with the requirements of the Florida Petroleum Contamination Agreement signed in October 1990 by the Secretary of the Florida Department of Environmental Regulation and the Assistant Secretary of the Navy.

5090

Ser 051E/027

Should you have any questions concerning the enclosure please contact Mr. Mike Clayton, Code 051EMC, at (904) 235-5859 or Mr. Bill Logsdon, Code 051EBL, at (904) 235-5474.

Sincerely,

A handwritten signature in dark ink, appearing to be 'W. A. Oster', with a long horizontal line extending to the right.

W. A. OSTER
Lieutenant Commander, U.S. Navy
By direction of
the Commanding Officer

Encl:

(1) Closure Assessment Report, Facility #333

Copy to:

FDEP

SOUTHDIV (Mr. Nick Ugolini, Code 1843)

Brown & Root Environmental (Mr. Gerald Goode)



CLOSURE ASSESSMENT REPORT
FAC. #333 WASTE OIL TANK & OIL/WATER SEPARATOR
COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

Prepared By:

SWS Environmental First Response
January 2, 1996

ENCL (1)

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LIST OF ATTACHMENTS

Attachment 1 - SITE MAP

LIST OF APPENDICES

Appendix A - FIELD NOTES

Appendix B - CHAIN-OF CUSTODY, LAB ANALYSES

1.0 INTRODUCTION

This is a report summarizing SWS's work in completing an assessment of the soils related to the removal of a 550 gallon underground storage tank (UST), oil water separator, and related underground piping at the Naval Surface Warfare Center Coastal Systems located in Panama City Beach, Florida. The work was completed at the site adjacent to the concrete wall labeled area #333, November 28, 1995 (see site map attached).

1.1 SCOPE OF WORK

SWS's investigative efforts included the following elements within the scope of work:

1. Excavated Area Assessment and organic vapor analysis(OVA) of soils.
2. Sampling and Lab Analyses of: a) a composite of waste oil tank Soils b) soils located three feet east of the waste oil tank c) soils adjacent to the oil water separator location and d) a composite soil sample of the excavated soils.
3. Sampling of groundwater if contaminants are found present in the soil during UST removal.
4. Completion of this report.

2.0 EXCAVATED AREA ASSESSMENT

As mentioned above, Southern Waste Services was mobilized to the naval facility to assess the contaminated soils, and transport them to a proper disposal facility. Upon arrival at the site ground water was noticed to be at 5.5 feet below land surface(BLS)at the bottom of the excavation and above a concrete slab upon which the underground storage tank had rested (See Appendix A, Field Notes). All associated piping along with the UST and oil/water separator had been subsequently removed and excavated soil piled on top of visquene and covered to ensure no migration due to precipitation.

2.1 Soil Sampling Within the UST Pit

As shown on the site map (Attached) four sampling points labeled S-1, S-2, S-3, S-4, were picked at the corners of the UST excavation at approximately four feet BLS (See Site Map, Attached). All

samples showed corrected values less than 10 ppm excessive hydrocarbon contamination in soil except for sample S-3 which exhibited a corrected value of 950 ppm. The soil sample at S-3 appeared to have a greenish dark gray oily sheen. Further investigation of the contaminated soil zone indicated that it may be within a groundwater - vadose "smear" zone.

2.2 Soil Sampling within the Pipeline trench and Oil/Water Separator

Three soil sampling points were located along the pipeline trench and within the oil/water separator area. As Shown on the site map they all exhibited a corrected value of less than 10 ppm excessive hydrocarbon contamination in the soil.

2.3 Exploratory Boring of Area between Containment and UST Area

Hand auger borings #8 and #9 were installed to the top of ground water found to be approximately five feet BLS. Both Hand auger borings found clean soil to the depth of 4.5 feet BLS. Hand auger boring #8 located 3.5 feet east of sample S-3 discovered contaminated soil at 4.5 feet BLS with a corrected organic reading of 2100 ppm (See Field Notes, Appendix A). Hand auger boring #9 located adjacent to the fenced in waste and drum containment area found greenish, gray oily soil 4.5 feet BLS. Soil samples taken from the contaminated zone gave readings of 900 ppm for total hydrocarbons and 1200 ppm filtered hydrocarbon for a corrected value of -300 ppm. This is indicative of a break through in the filter. All soil samples appeared to dramatically increase in their corrected hydrocarbon levels at 4.5 feet BLS, diesel or old hydrocarbon fuel odors were very apparent. Soil samples from the 4.5 foot deep zone were taken for lab analysis from Hand auger boring #9 (see the following lab analysis discussion).

3.0 SAMPLING AND LAB ANALYSES OF SITE SOILS

During the course of the field sampling, soil samples for laboratory analysis were collected from soils within the UST excavated area adjacent to sample sites S-1 through S-4. All samples of environmental media were collected in accordance with SWS's State approved CompQAPP #920203. All samples were properly contained, labeled and placed on ice for transport to the laboratory under chain-of-custody (See Appendix B). Results of analyses are discussed below.

3.1 Soil Sampling Within the UST (Waste Oil Tank) Pit

A composite soil sample for lab analysis was taken from borings S-1, S-2, S-3 and S-4 from a depth of four feet BLS and composited (see Site Map, Appendix B, Chain of Custody, Sample 001). These samples were analyzed by GEOS, Inc. for *Volatile Organics* (EPA Method 8240), *Semivolatile Organics* (EPA Method 8270), *Total Recoverable Petroleum Hydrocarbons* (EPA Method 9073) and *RCRA Metals*.

3.2 Soil Sampling adjacent to oil/water Separator Area

A soil sample S-004 was taken from the excavation wall adjacent to the oil/water separator by field sample location S-7 and subjected to lab analyses mentioned above (See Site Map attached, sample S-004).

3.3 Soil Sampling of Unscheduled Location

A third unscheduled sample S-002 (see Site Map, Appendix B, Lab Analyses) was taken for lab analyses EPA Methods 8240, 8270, 9073 and *RCRA Metals* from Hand auger boring S-9 and the potentially contaminated soil zone at 4.5 feet BLS.

3.4 Composite soil Sample of Excavated Soil

A composite soil sample S-003 was taken from the excavated soils for lab analysis including *TCLP Volatiles* and *TCLP Metals* for disposal characterization.

4.0 LAB ANALYSES OF SOIL SAMPLES

Analyses from the composite soil sample S-001 taken at the waste oil tank area exhibited abnormal concentrations of RCRA metals, lead 30.4 mg/Kg, barium 2.3 mg/Kg, and chromium 2.7 mg/Kg. All analyses for organic constituents this sample returned below detection limits (BDL), except for total recoverable hydrocarbons (TRPH) 960 mg/Kg, 1-methyl naphthalene 4800 µg/Kg, 2-methyl naphthalene 7500 µg/Kg, and naphthalene 1300 µg/Kg for total naphthalene 13,600 µg/Kg or 13.6 mg/Kg (see lab analyses Appendix B).

Analyses from the soil sample S-002 taken at Hand auger boring S-9 (See attached Site Map) located three feet east of the waste oil tank area exhibited concentrations of RCRA metals, *barium* 1.4 mg/Kg, and *chromium* 3.2 mg/Kg. All analyses for organic constituents this sample returned BDL except for *TRPH* 320 mg/Kg, *1-methyl naphthalene* 520 µg/Kg, and *2-methyl naphthalene* 410 µg/Kg for *total naphthalenes* 930 µg/Kg (see lab analyses Appendix B).

Analyses from the soil sample S-004 taken beside soil boring S-7 (See attached Site Map) located adjacent to the oil/water separator excavation area exhibited concentrations of RCRA metals, *barium* 26 mg/Kg, *cadmium* 1.0 mg/Kg, *chromium* 3.2 mg/Kg, *silver* 3.8 mg/Kg, and *mercury* 0.104 mg/Kg. All analyses for organic constituents this sample returned below detection limits except for *TRPH* 12 mg/Kg (see lab analyses Appendix B).

5.0 PLACEMENT AND TESTING OF INITIAL MONITOR WELL

Monitor well MW-1 was placed December 12, 1995. The location is shown on the site map attached. MW-1 was placed to test conditions in the surficial aquifer. The temporary monitor was screened from three feet BLS to eight feet BLS, extending both above and below the water table found at approximately 4.5 feet BLS.

Following the placement of temporary monitor well MW-1, a ground water sample was collected December 15, 1995. Lab testing data and Chain-of-Custody for this sampling date are included in Appendix B. The levels of contamination that were detected during this initial sampling were found to be high for benzene 1.5 µg/L. The "Monitor Only" for Perimeter well in G-II groundwater criteria for benzene is 1 µg/L if public or private drinking water wells are located within a half mile or quarter mile radius respectively.

6.0 CONCLUSION

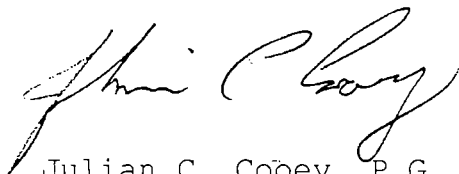
Under the limits of the specified scope of work listed in the proposal and contract for this environmental cleanup, the site has shown indication of contamination by petroleum products at the UST area and adjacent Hand auger boreholes S-8 & S-9. The constituents discovered at this location are believed to have resulted from contamination migrating within the "smear zone caused by rise and fall of the surficial aquifer.

This concludes SWS's report of the environmental assessment and cleanup at Area 333, Naval Surface Warfare Center Coastal Systems Station, Panama City Beach, Florida.

7.0 CERTIFICATION

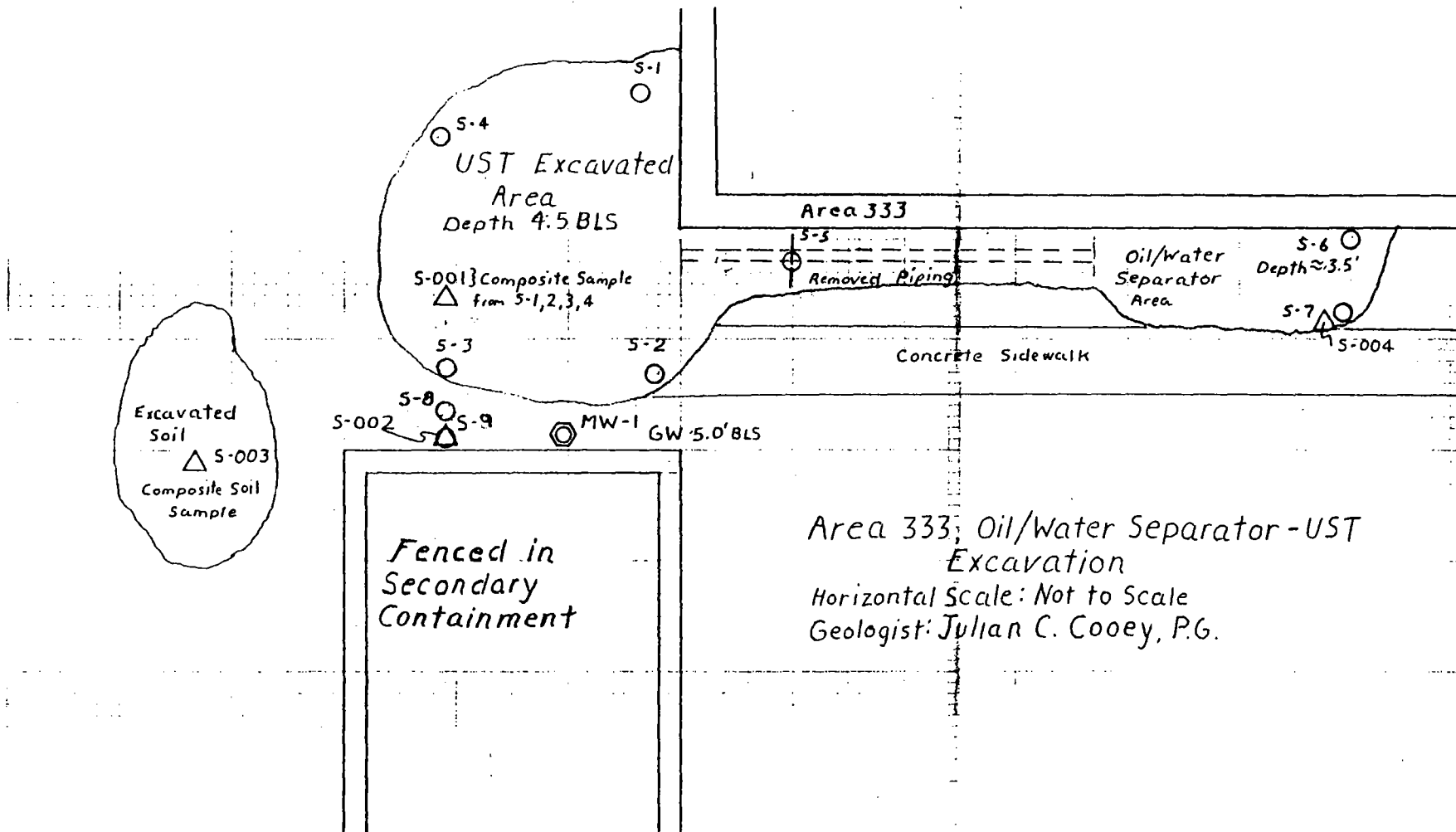
This Contamination Assessment Report was prepared by or under the personal direction of the undersigned registered professional. All parts of this Plan that are concerned with the practice of professional geology were prepared by Mr. Julian C. Cooley, P.G. Field sampling was conducted under the Florida State approved comprehensive quality assurance project plan (CompQAPP #920203). The site-specific health and safety plans were prepared by Mr. Julian C. Cooley, a certified Site Safety Supervisor and certified Environmental Trainer, per 29 CFR 1910.

Respectfully Submitted,

A handwritten signature in cursive script, appearing to read "Julian C. Cooley".

Julian C. Cooley, P.G., CET
Florida Registration #32

ATTACHMENT - 1
SITE MAP



Area 333; Oil/Water Separator - UST
Excavation

Horizontal Scale: Not to Scale
Geologist: Julian C. Cooley, P.G.

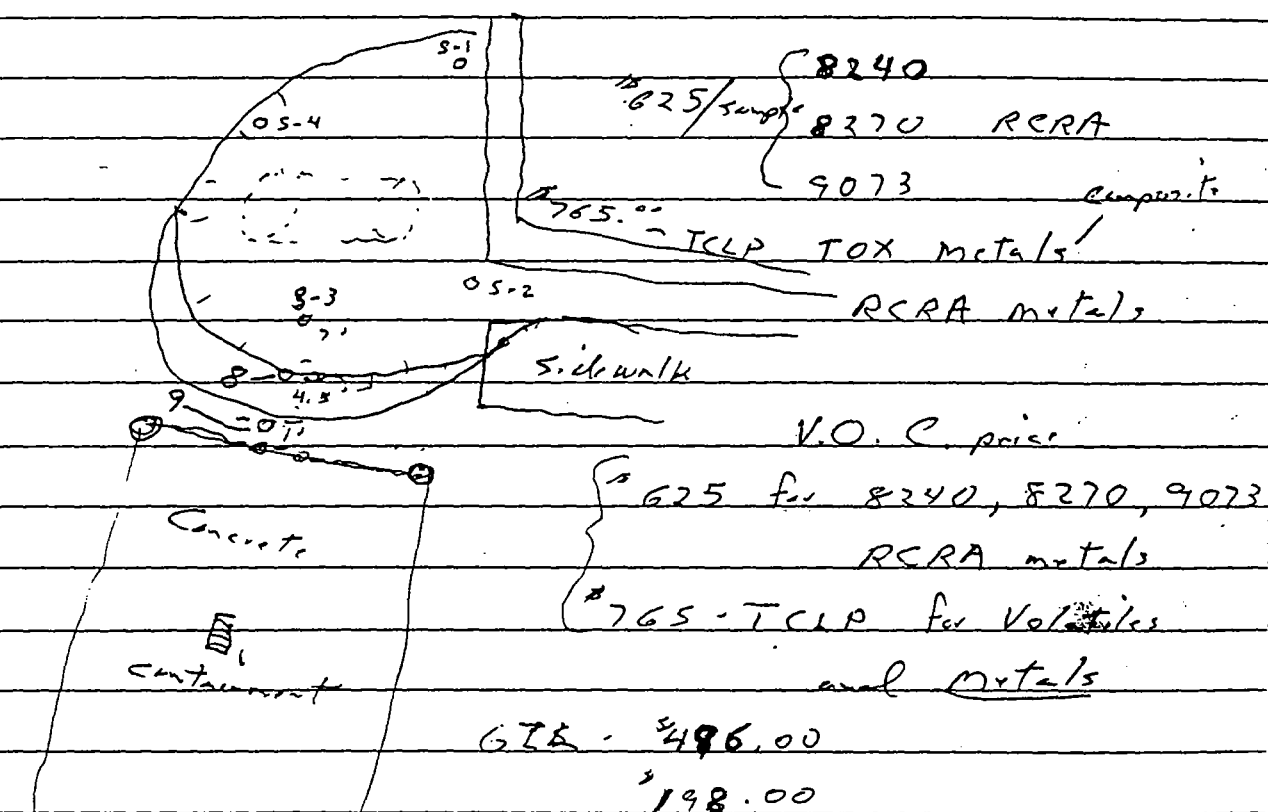
APPENDIX A
FIELD NOTES

Panama City Beach 11/28/95 1121

OVA (ppm) Porta fid

Sample #	T	F	C
5	<1	<1	= 0
6	<1	<1	= 0
7	<1	<1	= 0

Adjacent soil sample taken @ oil/water separator
Took composite of excavated soil sample @ 1145



	T	F	C
8-3'	1	<1	<1
4.5'	2200	100	= 2100
9-3'	<1	<1	<1
9-4'	<1	<1	<1
4.5'	(900)	(1200)	- 300

contaminated soil is between 4'-5' BLS

This area may be addressed under the IRP clean contract

Cloudy, 68°F

11/28/95

0820 Arrive @ USCG/Mary Facility, Panama City Beach, FL

Photos 3 of Oil/Water Separator and hole

1. Take hand auger adjacent to hole for sample

@ West Oil and RCRA metals

Oil group 8240, 8270, EPA 9073 RCRA metals

2. 550 gallon tank potential for 6-10" diesel

4 samples @ corners and one GW sample

Drew Pinkorsky = Bay Co. Storage Tanks Office

Mike Clayton @ PW Env. Office. # 235-5859

Ronan Jordan @ Superfund JES

Harry Marshall Proj Mgr.

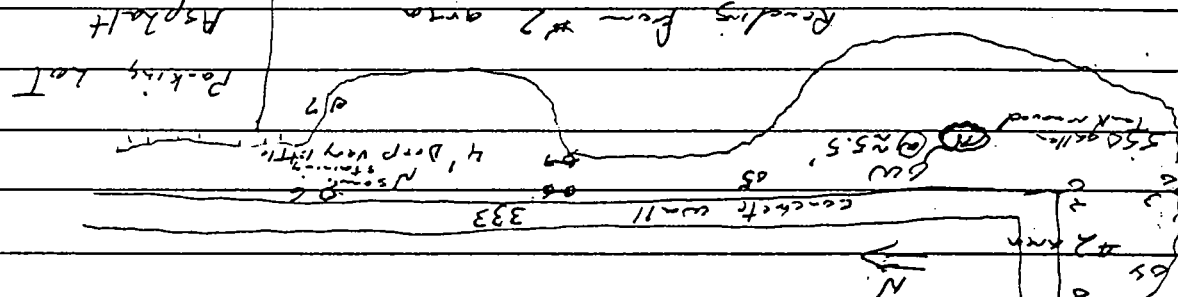
2. continued GW sample will be from standing

new water (acceptable for Bay Co's purpose

according to Drew Pinkorsky GW @ N5.5 BCS

For GW 602, 610, 418.1 Soil 8010 8100

Soil 243



5-1	4	1	3	1	1	10	950	5-3	11	11	5-4
5-2	1	0	1	0	0	0	950	5-3	11	11	5-4
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5-1	4	1	3	1	1	10	950	5-3	11	11	5-4
5-2	1	0	1	0	0	0	950	5-3	11	11	5-4
5-1	4	1	3	1	1	10	950	5-3	11	11	5-4
5-2	1	0	1	0	0	0	950	5-3	11	11	5-4
5-1	4	1	3	1	1	10	950	5-3	11	11	5-4
5-2	1	0	1	0	0	0	950	5-3	11	11	5-4
5-1	4	1	3	1	1	10	950	5-3	11	11	5-4
5-2	1	0	1	0	0	0	950	5-3	11	11	5-4
5-1	4	1	3	1	1	10	950	5-3	11	11	5-4
5-2											

slightly foggy
clearing to blue skies
70°F

12/15/95 NAS/USCG area #333

0900 getting Ter chest and hair from store

0918 Talked w/ K. @ GEOS lab said I should use
amber bottle "unpreserved" for TRPH 418.1 sample. K.
said would have someone meet UPS @ lab Saturday
no problem

0924 onsite called Mike Clayton on way

0935 Mike onsite.

Begin sampling & prep of well

removed 5 gallons or 10 volumes of G.W., sampled
for 602, 610 and 418.1

1104 offsite all decreased.

1110 @ PCB SWS office - samples to be shipped UPS
overstate Jeanie packing

1143 on way to Pat Grace's office Fort Walton

APPENDIX B
CHAIN-OF CUSTODY
LAB ANALYSES

1057 N. ELLIS ROAD, SUITE 17, JACKSONVILLE, FL 32254-2249 • (904) 786-8340
5909A BRECKENRIDGE PARKWAY, TAMPA, FL 33610-4237 • (813) 626-0101

CLIENT NAME: SWS Env. First Response		PROJECT NAME: NCSC HHS/ILS Contractor		PRESERVATIVE None	
ADDRESS: 1619 Moylan Rd.		P.O. NUMBER / PROJECT NUMBER HM 95-2570		CONTAINER SIZE AND TYPE 1qt.	
Panama City Beach Fl. 32407		PROJECT LOCATION: Panama City Beach. Florida		ANALYSES REQUIRED 8240 8270 9073 RCRA Metals ICLP Volatiles ICLP Metals	
PHONE: 800-852-8878		SAMPLED BY: Vulvin C. Cooney P.G.			
FAX: Harry Marsh		SPECIAL INSTRUCTIONS:			
TURN AROUND TIME or RESULTS DUE BY:					
<input type="checkbox"/> STANDARD		<input type="checkbox"/> VERBAL			
<input type="checkbox"/> RUSH		<input type="checkbox"/> FAX			
<input type="checkbox"/> OTHER		<input type="checkbox"/> HARD COPY			
				LAB USE	

GW—Groundwater SW—Surface Water DW—Drinking Water WW—Wastewater SO—Solid/Soil SL—Sludge HW—Hazardous Waste A—Air

DISTRIBUTION: White—Client Copy Yellow—Lab Copy Pink—Sample Copy

Geos Laboratories Inc.

CORPORATE OFFICES
1057 N. ELLIS ROAD, SUITE 17
JACKSONVILLE, FL 32254-2249

(904) 786-8340
(800) 770-4367 (GEOS)
FAX: (904) 786-7489

GEOLOGICAL, ENVIRONMENTAL AND OCEANOGRAPHIC SCIENCES

ANALYTICAL LABORATORY
1627 EAST 8th STREET
JACKSONVILLE, FL 32206

(904) 354-6755
FAX: (904) 354-3799

SOU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407
(800)852-8878

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6 Dec 1995

Report J5-11-080-01

LAB ID. 82223/E82101

Sample Description:

NCSC/JLS CONTRACTOR PANAMA CITY BEACH, FL.
WASTE OIL TANK COMPOSITE SOIL SAMPLE
P.O. #: HM 95-2570

SAMPLE ID.: SAMPLE 001

COLLECTED: 11/28/95 09:50

RECEIVED: 11/28/95

COLLECTED BY: J. COOEY

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Hydrocarbons, Total IR	960	mg/kg	9073	0.2	12/04/95	12/05/95	AM
ICAP Metals, Total			3050/6010				
Arsenic	BDL	mg/kg		7.5	11/30/95	11/30/95	JC
Barium	2.3	mg/kg		0.3	11/30/95	11/30/95	JC
Cadmium	BDL	mg/kg		0.5	11/30/95	11/30/95	JC
Chromium	2.7	mg/kg		0.5	11/30/95	11/30/95	JC
Lead	30.4	mg/kg		10.0	11/30/95	11/30/95	JC
Selenium	BDL	mg/kg		10.0	11/30/95	11/30/95	JC
Silver	BDL	mg/kg		1.0	11/30/95	11/30/95	JC
Mercury, Total	<0.075	mg/kg	7471	0.075	12/01/95	12/01/95	JC
Semi-Volatile Organics			3550\8270				
Acenaphthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Acenaphthylene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Aldrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Aniline	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzidine	BDL	µg/Kg		660	12/04/95	12/04/95	AT
Benzoic acid	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Benzo (a) anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (b) fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (k) fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (g,h,i) perylene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (a) pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzyl alcohol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
a-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
b-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
d-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
g-BHC (Lindane)	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroethoxy) methane	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroethyl) ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroisopropyl) ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT

Appendix B

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Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407
(800)852-8878

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6 Dec 1995

Report J5-11-080-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Bis (2-ethylhexyl) phthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Bromophenyl phenyl ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Butylbenzylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Chlordane	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
4-Chloroaniline	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Chloro-3-methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Chloronaphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Chlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Chlorophenyl phenyl ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Chrysene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDD	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDE	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDT	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dibenzo (a,h) anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dibenzofuran	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Di-n-butylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,2-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,3-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,4-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
3,3'-Dichlorobenzidine	BDL	µg/Kg		660	12/04/95	12/04/95	AT
2,4-Dichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dieldrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Diethylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4-Dimethylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dimethylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4-Dinitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
2,4-Dinitrotoluene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,6-Dinitrotoluene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Di-n-octylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,2-Diphenylhydrazine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan I	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan II	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan sulfate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endrin aldehyde	BDL	µg/Kg		330	12/04/95	12/04/95	AT

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Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
 1619 MOYLAN ROAD
 PANAMA CITY BEACH, FL. 32407
 (800)852-8878

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Report J5-11-080-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Fluorene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Heptachlor	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Heptachlor epoxide	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorobutadiene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorocyclopentadiene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachloroethane	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Indeno (1,2,3-c,d) pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Isophorone	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Methyl-4,6-dinitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
1-Methylnaphthalene	4800	µg/Kg		330	12/04/95	12/04/95	AT
2-Methylnaphthalene	7300	µg/Kg		330	12/04/95	12/04/95	AT
2-Methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Naphthalene	1300	µg/Kg		330	12/04/95	12/04/95	AT
2-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
3-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
4-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Nitrobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Nitrophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Nitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
N-Nitrosodimethylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
N-Nitrosodiphenylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
N-Nitrosodi-n-propylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
PCB-1016	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1221	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1232	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1242	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1248	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1254	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1260	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Pentachlorophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Phenanthrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Phenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT

SQU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407
(800)852-8878

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Report J5-11-080-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Pyridine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Toxaphene	BDL	µg/Kg		3300	12/04/95	12/04/95	AT
1,2,4-Trichlorobenzene -	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4,5-Trichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4,6-Trichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Surrogates							
Nitrobenzene-d5	53	Min: 23		Max: 120			
2-Fluorobiphenyl	77	Min: 30		Max: 115			
Terphenyl-d14	65	Min: 18		Max: 137			
Phenol-d5	51	Min: 24		Max: 113			
2-Fluorophenol	65	Min: 25		Max: 121			
2,4,6-Tribromophenol	69	Min: 19		Max: 122			
Volatile Organics			8240\8260				
Acetone	BDL	µg/Kg		250	11/30/95	11/30/95	AT
Benzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromodichloromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromoform	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
2-Butanone	BDL	µg/Kg		250	11/30/95	11/30/95	AT
Carbon disulfide	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Carbon tetrachloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chlorobenzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chlorodibromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloroform	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Dibromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,4-Dichloro-2-butene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Dichlorodifluoromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1-Dichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2-Dichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1-Dichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
trans-1,2-Dichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2-Dichloropropane	BDL	µg/Kg		10	11/30/95	11/30/95	AT

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Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
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PANAMA CITY BEACH, FL. 32407
(800)852-8878

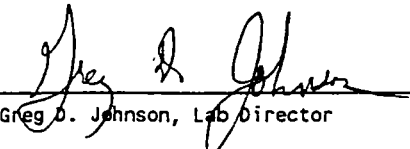
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Report J5-11-080-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
cis-1,3-Dichloropropene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
trans-1,3-Dichloropropene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Ethanol	BDL	µg/Kg		1000	11/30/95	11/30/95	AT
Ethylbenzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Ethyl methacrylate	BDL	µg/Kg		10	11/30/95	11/30/95	AT
2-Hexanone	BDL	µg/Kg		100	11/30/95	11/30/95	AT
Iodomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Methylene chloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
4-Methyl-2-pentanone	BDL	µg/Kg		100	11/30/95	11/30/95	AT
Styrene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,2,2-Tetrachloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Tetrachloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Toluene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,1-Trichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,2-Trichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Trichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Trichlorofluoromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2,3-Trichloropropane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Vinyl chloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Xylenes (Total)	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Surrogates							
Toluene-d8	101	Min: 81		Max: 117			
4-Bromofluorobenzene	90	Min: 74		Max: 121			
1,2-Dichloroethane-d4	96	Min: 70		Max: 121			


Greg D. Johnson, Lab Director

SOU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407
(800)852-8878

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6 Dec 1995

Report J5-11-080-02

LAB ID. 82223/E82101

Sample Description:

NCSC/JLS CONTRACTOR PANAMA CITY BEACH, FL.
SOIL SAMPLE 4.5' BLS + 3'E OF W.O.T.
P.O. #: HM 95-2570

SAMPLE ID.: SAMPLE 002

COLLECTED: 11/28/95 11:00

RECEIVED: 11/28/95

COLLECTED BY: J. COOEY

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Hydrocarbons, Total IR	320	mg/kg	9073	0.2	12/04/95	12/05/95	AM
ICAP Metals, Total			3050/6010				
Arsenic	BDL	mg/kg		7.5	11/30/95	11/30/95	JC
Barium	1.4	mg/kg		0.3	11/30/95	11/30/95	JC
Cadmium	BDL	mg/kg		0.5	11/30/95	11/30/95	JC
Chromium	3.2	mg/kg		0.5	11/30/95	11/30/95	JC
Lead	BDL	mg/kg		10.0	11/30/95	11/30/95	JC
Selenium	BDL	mg/kg		10.0	11/30/95	11/30/95	JC
Silver	BDL	mg/kg		1.0	11/30/95	11/30/95	JC
Mercury, Total	<0.075	mg/kg	7471	0.075	12/01/95	12/01/95	JC
Semi-Volatile Organics			3550\8270				
Acenaphthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Acenaphthylene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Aldrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Aniline	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzidine	BDL	µg/Kg		660	12/04/95	12/04/95	AT
Benzoic acid	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Benzo (a) anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (b) fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (k) fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (g,h,i) perylene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (a) pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzyl alcohol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
a-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
b-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
d-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
g-BHC (Lindane)	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroethoxy) methane	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroethyl) ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroisopropyl) ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT

SOU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
 1619 MOYLAN ROAD
 PANAMA CITY BEACH, FL. 32407
 (800)852-8878

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6 Dec 1995

Report J5-11-080-02

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Bis (2-ethylhexyl) phthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Bromophenyl phenyl ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Butylbenzylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Chlordane	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
4-Chloroaniline	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Chloro-3-methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Chloronaphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Chlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Chlorophenyl phenyl ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Chrysene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDD	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDE	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDT	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dibenzo (a,h) anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dibenzofuran	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Di-n-butylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,2-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,3-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,4-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
3,3'-Dichlorobenzidine	BDL	µg/Kg		660	12/04/95	12/04/95	AT
2,4-Dichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dieldrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Diethylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4-Dimethylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dimethylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4-Dinitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
2,4-Dinitrotoluene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,6-Dinitrotoluene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Di-n-octylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,2-Diphenylhydrazine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan I	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan II	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan sulfate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endrin aldehyde	BDL	µg/Kg		330	12/04/95	12/04/95	AT

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Report J5-11-080-02

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Fluorene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Heptachlor	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Heptachlor epoxide	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorobutadiene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorocyclopentadiene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachloroethane	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Indeno (1,2,3-c,d) pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Isophorone	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Methyl-4,6-dinitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
1-Methylnaphthalene	520	µg/Kg		330	12/04/95	12/04/95	AT
2-Methylnaphthalene	410	µg/Kg		330	12/04/95	12/04/95	AT
2-Methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Naphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
3-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
4-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Nitrobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Nitrophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Nitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
N-Nitrosodimethylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
N-Nitrosodiphenylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
N-Nitrosodi-n-propylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
PCB-1016	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1221	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1232	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1242	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1248	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1254	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1260	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Pentachlorophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Phenanthrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Phenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT

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Report J5-11-080-02

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Pyridine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Toxaphene	BDL	µg/Kg		3300	12/04/95	12/04/95	AT
1,2,4-Trichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4,5-Trichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4,6-Trichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Surrogates							
Nitrobenzene-d5	49	Min: 23		Max: 120			
2-Fluorobiphenyl	72	Min: 30		Max: 115			
Terphenyl-d14	67	Min: 18		Max: 137			
Phenol-d5	55	Min: 24		Max: 113			
2-Fluorophenol	65	Min: 25		Max: 121			
2,4,6-Tribromophenol	68	Min: 19		Max: 122			
Volatile Organics							
			8240\8260				
Acetone	BDL	µg/Kg		250	11/30/95	11/30/95	AT
Benzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromodichloromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromoform	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
2-Butanone	BDL	µg/Kg		250	11/30/95	11/30/95	AT
Carbon disulfide	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Carbon tetrachloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chlorobenzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chlorodibromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloroform	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Dibromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,4-Dichloro-2-butene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Dichlorodifluoromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1-Dichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2-Dichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1-Dichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
trans-1,2-Dichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2-Dichloropropane	BDL	µg/Kg		10	11/30/95	11/30/95	AT

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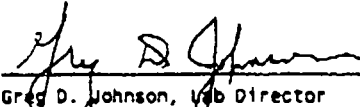
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Report J5-11-080-02

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
cis-1,3-Dichloropropene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
trans-1,3-Dichloropropene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Ethanol	BDL	µg/Kg		1000	11/30/95	11/30/95	AT
Ethylbenzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Ethyl methacrylate	BDL	µg/Kg		10	11/30/95	11/30/95	AT
2-Hexanone	BDL	µg/Kg		100	11/30/95	11/30/95	AT
Iodomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Methylene chloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
4-Methyl-2-pentanone	BDL	µg/Kg		100	11/30/95	11/30/95	AT
Styrene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,2,2-Tetrachloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Tetrachloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Toluene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,1-Trichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,2-Trichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Trichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Trichlorofluoromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2,3-Trichloropropane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Vinyl chloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Xylenes (Total)	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Surrogates							
Toluene-d8	95	Min: 81		Max: 117			
4-Bromofluorobenzene	89	Min: 74		Max: 121			
1,2-Dichloroethane-d4	95	Min: 70		Max: 121			


 Greg D. Johnson, Lab Director

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SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407
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Report J5-11-080-03

LAB ID. 82223/E82101

Sample Description:

NCSC/JLS CONTRACTOR PANAMA CITY BEACH, FL.
COMPOSITE SAMPLE EXCAVATED SOILS
P.O. #: HM 95-2570

SAMPLE ID.: SAMPLE 003

COLLECTED: 11/28/95

RECEIVED: 11/28/95

COLLECTED BY: J. COOEY

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
ICAP Metals, TCLP			1311\6010				
Silver	BDL	mg/L		0.010	12/01/95	12/05/95	JC
Barium	0.078	mg/L		0.003	12/01/95	12/05/95	JC
Cadmium	BDL	mg/L		0.005	12/01/95	12/05/95	JC
Chromium	BDL	mg/L		0.005	12/01/95	12/05/95	JC
Lead	0.280	mg/L		0.100	12/01/95	12/05/95	JC
Arsenic	BDL	mg/L		0.075	12/01/95	12/05/95	JC
Selenium	BDL	mg/L		0.100	12/01/95	12/05/95	JC
Mercury, TCLP	<0.01	mg/L	1311\7471	0.01	12/01/95	12/01/95	JC
Purgeable Organics TCLP			1311\8260				
Benzene, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Carbon tetrachloride, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Chlorobenzene, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Chloroform, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
1,4-Dichlorobenzene, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
1,2-Dichloroethane, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
1,1-Dichloroethene, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Methyl Ethyl Ketone, TCLP	BDL	mg/L		2.0	11/30/95	11/30/95	AT
Tetrachloroethene, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Trichloroethene, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Vinyl chloride, TCLP	BDL	mg/L		0.20	11/30/95	11/30/95	AT
Surrogates							
4-Bromofluorobenzene	89	Min: 86		Max: 115			
Toluene-d8	97	Min: 88		Max: 110			
1,2-Dichloroethane-d4	101	Min: 76		Max: 114			

SOU02

Attn: HARRY MARSH

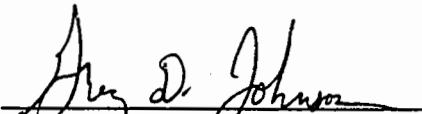
SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407
(800)852-8878

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Report J5-11-080-03

LAB ID. 82223/E82101


Greg D. Johnson, Lab Director

CLIENT NAME: Harry Marsh SWS Environmental First Response		PROJECT NAME: Naval Research Labs		PRESERVATIVE CONTAINER SIZE AND TYPE 8240 8270 9073 RCRA Metals
ADDRESS: 1609 Maylan Rd		P.O. NUMBER / PROJECT NUMBER HT 95-7525-70 other		
PROJECT LOCATION: Panama City Beach, FL		SAMPLED BY: Julian C. Coory P.G.		
PHONE: 1-800-552-8878 FAX:		SPECIAL INSTRUCTIONS:		
CONTACT: Harry Marsh		TURN AROUND TIME or RESULTS DUE BY: <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> VERBAL <input type="checkbox"/> RUSH <input checked="" type="checkbox"/> FAX <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> HARD COPY		

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLING		MATRIX	NO. OF CONTAIN.										
		DATE	TIME												
#4	Oil/Water Separator Adjacent Soil Sample	11/29/95	1015	SO	1	✓	✓	✓	✓						

* GW—Groundwater SW—Surface Water DW—Drinking Water WW—Wastewater SO—Solid/Soil SL—Sludge HW—Hazardous Waste A—Air

FIELD PARAMETERS / COMMENTS:		TRANS. NO.	TRANSFERS RELINQUISHED BY:	ACCEPTED BY:	DATE	TIME
		1	Julian C. Coory, P.G.	Greg Johnson	11/30/95	09:35
		2	Greg Johnson			
		3				
CONTAINERS/SEALS INTACT <input type="checkbox"/> YES <input type="checkbox"/> NO	ON ICE / 4°C <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	SHIPPED VIA	4			

Geos Laboratories Inc.

CORPORATE OFFICES
1057 N. ELLIS ROAD, SUITE 17
JACKSONVILLE, FL 32254-2249

(904) 786-8340
(800) 770-4367 (GEOS)
FAX: (904) 786-7489

GEOLOGICAL, ENVIRONMENTAL AND OCEANOGRAPHIC SCIENCES

ANALYTICAL LABORATORY
1627 EAST 8th STREET
JACKSONVILLE, FL 32206

(904) 354-6755
FAX: (904) 354-3799

SQU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407

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Report J5-11-087-01

LAB ID. 82223/E82101

Sample Description:

OIL WATER SEPARATOR ADJACENT SOIL SAMPLES

LOCATION: PANAMA CITY BEACH/ NAVAL RESEARCH LABS

P.O. # HM 95-2570

SAMPLE ID.: #4

COLLECTED: 11/28/95 10:15

RECEIVED: 11/30/95

COLLECTED BY: J. COOEE

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Hydrocarbons, Total IR	12	mg/kg	9073	0.2	12/04/95	12/05/95	AM
ICAP Metals, Total			3050/6010				
Arsenic	BDL	mg/kg		7.5	12/05/95	12/06/95	JC
Barium	26	mg/kg		0.3	12/05/95	12/06/95	JC
Cadmium	1.0	mg/kg		0.5	12/05/95	12/06/95	JC
Chromium	9.2	mg/kg		0.5	12/05/95	12/06/95	JC
Lead	976	mg/kg		10.0	12/05/95	12/06/95	JC
Selenium	BDL	mg/kg		10.0	12/05/95	12/06/95	JC
Silver	3.8	mg/kg		1.0	12/05/95	12/06/95	JC
Mercury, Total	0.104	mg/kg	7471	0.075	12/01/95	12/01/95	JC
Semi-Volatile Organics			3550\8270				
Acenaphthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Acenaphthylene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Aldrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Aniline	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzidine	BDL	µg/Kg		660	12/04/95	12/04/95	AT
Benzoic acid	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Benzo (a) anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (b) fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (k) fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (g,h,i) perylene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzo (a) pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Benzyl alcohol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
a-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
b-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
d-BHC	BDL	µg/Kg		330	12/04/95	12/04/95	AT
g-BHC (Lindane)	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroethoxy) methane	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroethyl) ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Bis (2-chloroisopropyl) ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT

SOU02

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1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407

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Report J5-11-087-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Bis (2-ethylhexyl) phthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Bromophenyl phenyl ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Butylbenzylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Chlordane	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
4-Chloroaniline	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Chloro-3-methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Chloronaphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Chlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Chlorophenyl phenyl ether	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Chrysene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDD	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDE	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4,4'-DDT	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dibenzo (a,h) anthracene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dibenzofuran	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Di-n-butylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,2-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,3-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,4-Dichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
3,3'-Dichlorobenzidine	BDL	µg/Kg		660	12/04/95	12/04/95	AT
2,4-Dichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dieldrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Diethylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4-Dimethylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Dimethylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4-Dinitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
2,4-Dinitrotoluene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,6-Dinitrotoluene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Di-n-octylphthalate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
1,2-Diphenylhydrazine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan I	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan II	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endosulfan sulfate	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endrin	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Endrin aldehyde	BDL	µg/Kg		330	12/04/95	12/04/95	AT

SOU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407

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6 Dec 1995

Report J5-11-087-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Fluoranthene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Fluorene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Heptachlor	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Heptachlor epoxide	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorobutadiene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachlorocyclopentadiene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Hexachloroethane	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Indeno (1,2,3-c,d) pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Isophorone	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Methyl-4,6-dinitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
1-Methylnaphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Methylnaphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Methylphenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Naphthalene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
3-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
4-Nitroaniline	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Nitrobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2-Nitrophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
4-Nitrophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
N-Nitrosodimethylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
N-Nitrosodiphenylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
N-Nitrosodi-n-propylamine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
PCB-1016	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1221	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1232	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1242	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1248	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1254	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
PCB-1260	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Pentachlorophenol	BDL	µg/Kg		1700	12/04/95	12/04/95	AT
Phenanthrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Phenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT

SQU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.

1619 MOYLAN ROAD

PANAMA CITY BEACH, FL. 32407

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6 Dec 1995

Report J5-11-087-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Pyrene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Pyridine	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Toxaphene	BDL	µg/Kg		3300	12/04/95	12/04/95	AT
1,2,4-Trichlorobenzene	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4,5-Trichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
2,4,6-Trichlorophenol	BDL	µg/Kg		330	12/04/95	12/04/95	AT
Surrogates							
Nitrobenzene-d5	62	Min: 23		Max: 120			
2-Fluorobiphenyl	74	Min: 30		Max: 115			
Terphenyl-d14	70	Min: 18		Max: 137			
Phenol-d5	56	Min: 24		Max: 113			
2-Fluorophenol	73	Min: 25		Max: 121			
2,4,6-Tribromophenol	73	Min: 19		Max: 122			
Volatile Organics			8240\8260				
Acetone	BDL	µg/Kg		250	11/30/95	11/30/95	AT
Benzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromodichloromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromoform	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Bromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
2-Butanone	BDL	µg/Kg		250	11/30/95	11/30/95	AT
Carbon disulfide	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Carbon tetrachloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chlorobenzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chlorodibromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloroform	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Chloromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Dibromomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,4-Dichloro-2-butene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Dichlorodifluoromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1-Dichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2-Dichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1-Dichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
trans-1,2-Dichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2-Dichloropropane	BDL	µg/Kg		10	11/30/95	11/30/95	AT

SOU02

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1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407

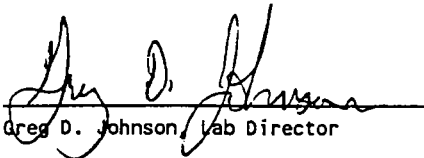
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6 Dec 1995

Report J5-11-087-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
cis-1,3-Dichloropropene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
trans-1,3-Dichloropropene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Ethanol	BDL	µg/Kg		1000	11/30/95	11/30/95	AT
Ethylbenzene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Ethyl methacrylate	BDL	µg/Kg		10	11/30/95	11/30/95	AT
2-Hexanone	BDL	µg/Kg		100	11/30/95	11/30/95	AT
Iodomethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Methylene chloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
4-Methyl-2-pentanone	BDL	µg/Kg		100	11/30/95	11/30/95	AT
Styrene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,2,2-Tetrachloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Tetrachloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Toluene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,1-Trichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,1,2-Trichloroethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Trichloroethene	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Trichlorofluoromethane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
1,2,3-Trichloropropane	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Vinyl chloride	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Xylenes (Total)	BDL	µg/Kg		10	11/30/95	11/30/95	AT
Surrogates							
Toluene-d8	99	Min: 81		Max: 117			
4-Bromofluorobenzene	102	Min: 74		Max: 121			
1,2-Dichloroethane-d4	107	Min: 70		Max: 121			


Greg D. Johnson, Lab Director

Geos Inc.1057 N. ELLIS ROAD, SUITE 17, JACKSONVILLE, FL 32254-2249 • (904) 786-8340
5909A BRECKENRIDGE PARKWAY, TAMPA, FL 33610-4237 • (813) 626-0101**CHAIN OF CUSTODY RECORD**

JOB NUMBER

3512049

1619 Moxley Dr. Panama City Beach Fl.		PROJECT LOCATION: Area #333 UST site USCG INAS Panama City Beach, Fl.	
PHONE 800 852 8878	FAX:	SAMPLED BY: Julian C. Cooley PG.	
CONTACT Harry Marsh		SPECIAL INSTRUCTIONS:	
TURN AROUND TIME or RESULTS DUE BY: <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> RUSH <input type="checkbox"/> OTHER		<input type="checkbox"/> VERBAL <input type="checkbox"/> FAX <input type="checkbox"/> HARD COPY	

CONTAINER SIZE AND TYPE
602
610
418.1

SAMPLE ID	SAMPLE DESCRIPTION	SAMPLING		METHOD	NO. OF CONTAINERS										
		DATE	TIME												
MW-1	Groundwater, UST area #333	12-15-95	10:10	GW	3	✓	✓	✓							

GW—Groundwater SW—Surface Water DW—Drinking Water WW—Wastewater SO—Solid/Soil SL—Sludge HW—Hazardous Waste A—Air

FIELD PARAMETERS / COMMENTS: Bailed by hand 5 gallons, or 5 vol. at 100 ft.		TRANS. NO.	TRANSFERS RELINQUISHED BY:	ACCEPTED BY:	DATE	TIME
		1	Shi Cooley	UPS NDA	12/15/95	11:30
		2	UPS NDA	0793 8649 138	12/18/95	9:30
		3	0793 8649 138	K. B. B. B.		
		4				
* ON ICE / 4°C						
CONTAINERS/SEALS INTACT <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		SHIPPED VIA				

DISTRIBUTION: White—Client Copy Yellow—Lab Copy Pink—Sample Copy

010 51:35 9043543799 ADL LABS

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Geos Laboratories Inc.

CORPORATE OFFICES
1057 N. ELLIS ROAD, SUITE 17
JACKSONVILLE, FL 32254-2249

(904) 786-8340
(800) 770-4367 (GEOS)
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GEOLOGICAL, ENVIRONMENTAL AND OCEANOGRAPHIC SCIENCES

ANALYTICAL LABORATORY
1627 EAST 8th STREET
JACKSONVILLE, FL 32206

(904) 354-6755
FAX: (904) 354-3799

SOU02

Attn: HARRY MARSH

SOUTHERN WASTE SERVICES, INC.
1619 MOYLAN ROAD
PANAMA CITY BEACH, FL. 32407

Page 1

22 Dec 1995

Report J5-12-049-01

LAB ID. 82223/E82101

Sample Description:

UST OIL/WATER SEPARATOR

AREA #333 UST SITE/USCG-NAS PANAMA CITY BEACH, FL.

GROUNDWATER

SAMPLE ID.: MW-1

COLLECTED: 12/15/95 10:10

RECEIVED: 12/18/95

COLLECTED BY: J. COOEY

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
Hydrocarbons, Total IR	1.79	mg/L	418.1	0.200	12/21/95	12/21/95	AM
Polynuclear Aromatics			625\8270				
Naphthalene	BDL	µg/L		10	12/20/95	12/21/95	AT
Acenaphthylene	BDL	µg/L		10	12/20/95	12/21/95	AT
1-Methylnaphthalene	49	µg/L		10	12/20/95	12/21/95	AT
2-Methylnaphthalene	BDL	µg/L		10	12/20/95	12/21/95	AT
Acenaphthene	BDL	µg/L		10	12/20/95	12/21/95	AT
Fluorene	BDL	µg/L		10	12/20/95	12/21/95	AT
Phenanthrene	BDL	µg/L		10	12/20/95	12/21/95	AT
Anthracene	BDL	µg/L		10	12/20/95	12/21/95	AT
Fluoranthene	BDL	µg/L		10	12/20/95	12/21/95	AT
Pyrene	BDL	µg/L		10	12/20/95	12/21/95	AT
Benzo(a)anthracene	BDL	µg/L		10	12/20/95	12/21/95	AT
Chrysene	BDL	µg/L		10	12/20/95	12/21/95	AT
Benzo(b)fluoranthene	BDL	µg/L		10	12/20/95	12/21/95	AT
Benzo(k)fluoranthene	BDL	µg/L		10	12/20/95	12/21/95	AT
Benzo(a)pyrene	BDL	µg/L		10	12/20/95	12/21/95	AT
Indeno(1,2,3-c,d)pyrene	BDL	µg/L		10	12/20/95	12/21/95	AT
Dibenzo(a,h)anthracene	BDL	µg/L		10	12/20/95	12/21/95	AT
Benzo(g,h,i)perylene	BDL	µg/L		10	12/20/95	12/21/95	AT
Surrogates							
Nitrobenzene-d5	74	Min: 35		Max: 114			
2-Fluorobiphenyl	80	Min: 43		Max: 116			
4-Terphenyl-d14	50	Min: 33		Max: 141			
Volatile Aromatics			602				
Methyl-tert-butyl ether	BDL	µg/L		5.0	12/18/95	12/18/95	OLS
Benzene	1.5	µg/L		1.0	12/18/95	12/18/95	OLS
Toluene	BDL	µg/L		1.0	12/18/95	12/18/95	OLS
Ethyl benzene	1.0	µg/L		1.0	12/18/95	12/18/95	OLS
Xylene, Total	5.2	µg/L		1.0	12/18/95	12/18/95	OLS
Chlorobenzene	BDL	µg/L		1.0	12/18/95	12/18/95	OLS

S0002

Attn: J. PARSH

SOUTHEAST WASTE SERVICES, INC.

1619 W. 10TH AVE

PANAMA BEACH, FL. 32407

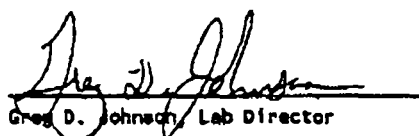
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22 Dec 1995

Report J5-12-049-01

LAB ID. 82223/E82101

Parameter	Result	Units	Method	Det. Limit	Extracted	Analyzed	Analyst
1,4-Dichlorobenzene	BDL	µg/L		1.0	12/18/95	12/18/95	OLS
1,3-Dichlorobenzene	BDL	µg/L		1.0	12/18/95	12/18/95	OLS
1,2-Dichlorobenzene	BDL	µg/L		1.0	12/18/95	12/18/95	OLS
Surrogate							
Bromobenzene	102	Min: 70		Max: 130			


Greg D. Johnson, Lab Director

APPENDIX D
SOIL BORINGS LOGS

SHEET 1 OF 1

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:										PROJECT: CTO 0008 Site 333		BORING NO. SB02	
See Soil Boring Location Map										JOB NO. 7113		TOTAL DEPTH: 4.5'	
										PROJ. MGR: G. Goode		LOGGED BY: G. Helms	
										DRILLING CONTRACTOR: NA		EDITED BY:	
										DRILL RIG TYPE: NA			
										DRILLER'S NAME: NA			
										SAMPLING METHODS: hand auger			
										STARTED TIME: 1603		DATE: 6/10/98	
										COMPLETED TIME: 1637		DATE: 6/10/98	
BORING DEPTH (ft): 4.5'													
CASING DEPTH (ft): NA													
WATER DEPTH (ft): —													
SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION	
1										1			
2	HA	—	—	—	mid		0	0	0	2			
3										3	X _{SW}		
4	HA	—	—	—	wet		10	8	2	4			
5										5	X _{SM}		
6										6			
7										7			
8										8			
9										9			

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING: See Site Boring Location Map	PROJECT: CTO 0008 Site 333		BORING NO. SB03
	TOTAL DEPTH: 4.5'		LOGGED BY: G. Helms
	JOB NO. 713	EDITED BY:	
	PROJ.MGR: G. Goode		
	DRILLING CONTRACTOR: NA		
	DRILL RIG TYPE: NA		
	DRILLER'S NAME: NA		
	SAMPLING METHODS: hand auger		
	STARTED TIME: 0803	DATE: 6/11/96	
	COMPLETED TIME: 0826	DATE: 6/11/96	
BORING DEPTH (ft) 4.5'			
CASING DEPTH (ft) NA			
WATER DEPTH (ft) —			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	—	—	—	moist	—	10	8	2	2		
3										3	X SW	
4	HA	—	—	—	WET	—	29	10	19	4		
5										5	X SW	
6										6		
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

SAND, lt gray, banded w/dk gray organic material; sand is predominately qtz, poorly graded, moist fg-mg.
SAND; dk gray, fg-mg predominately qtz, trace silt, poorly graded, wet at 4.5' bis.

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

2804

LOCATION OF BORING:

See Site Boring Location Map

PROJECT: CTO 0008 Site 333		BORING NO. PCY-333-MW04
JOB NO. 7113		TOTAL DEPTH: 12.2'
PROJ. MGR: G. Goode	LOGGED BY: G. Helms	
DRILLING CONTRACTOR: NA	EDITED BY:	
DRILL RIG TYPE: NA		
DRILLER'S NAME: NA		
SAMPLING METHODS: hand auger		
STARTED TIME: 0830	DATE: 6/11/96	
COMPLETED TIME: 0908	DATE: 6/11/96	
BORING DEPTH (ft): 12.2'		
CASING DEPTH (ft): NA		
WATER DEPTH (ft): —		

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	—	—	—	moist	—	20	2		2		SAND, lt. tan, Ag-mg, predominantly qtz., poorly graded, predominantly med grained, trace silt, moist.
3										3	SP	
4	HA	—	—	—	WET	—	20	2		4		SAND, lt. gray; Very fine to med. grained, predominantly qtz., poorly graded (some grains are very fine), some silt, wet 4.5.
5	HA	—	—	—	WET	—	100	40	60	5		
6										6		
7	HA	—	—	—	WET	—	100	40	60	7		* 5.0' noted sand and silt mixed dk gray to blk, diesel like odor w/oily sheen
8										8		
9										9		* 7.0' - SAND as above w/ strong diesel odor.
												* 8.0' - still had same material as above.

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

* PCY-333-MW04 was extended by hand, by drillers to 12.2' bls.

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING:										PROJECT: CTO 0008 Site 333		BORING NO. SB05	
										JOB NO. 7113		TOTAL DEPTH: 4.2'	
										PROJ.MGR: G. Goode		LOGGED BY: G. Helms	
										DRILLING CONTRACTOR: NA		EDITED BY:	
										DRILL RIG TYPE: NA			
										DRILLER'S NAME: NA			
										SAMPLING METHODS: hand auger			
										STARTED TIME: 0955		DATE: 6/11/96	
										COMPLETED TIME: 1021		DATE: 6/11/96	
										BORING DEPTH (ft): 4.2'			
										CASING DEPTH (ft): NA			
										WATER DEPTH (ft): —			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE
1										1	
2	HA	—	—	—	moist	—	0	0	0	2	
3										3	X
4	HA	—	—	—	moist wet	—	9	9	0	4	
5										5	X
6										6	
7										7	
8										8	
9										9	

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

SAND, lt. tan, fg-mg, predominantly qtz., predominantly med. grained, trace silt, well graded, moist, some organic material; dk gray in color.

SAND^{ym} Silty SAND, dk gray, fg-mg qtz., poorly graded, abundant organic matter, moist, then wet at 4.2'.

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING: See Soil Boring Location Map	PROJECT: CTO 0008 Site 333		BORING NO. 5806
	JOB NO. 7113		TOTAL DEPTH: 4.5'
	PROJ. MGR: G. Goode		LOGGED BY: G. Helms
	DRILLING CONTRACTOR: NA		EDITED BY:
	DRILL RIG TYPE: NA		
	DRILLER'S NAME: NA		
	SAMPLING METHODS: hand auger		
	STARTED TIME: 1115 H.A.M.		DATE: 6/11/96
	COMPLETED TIME: 1149		DATE: 6/11/96
	BORING DEPTH (ft) 4.5'		
CASING DEPTH (ft) NA			
WATER DEPTH (ft) —			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	—	—	—	moist	—	0	0	0	2		SAND, dk gray, fg-mg, predominantly qtz., some silt, some organic material, moist.
3	HA	—	—	—	moist wet	—	4	4	4	3	X	
4										4	X	
5										5	X	SAND, lt. tan, fg-mg, (predominantly med. grained), predominantly qtz., trace silt, trace organic material, moist from 2.8' to 3.2' then wet. Sample collected from 2.8'-3.2'. Continued hand augering to 4.5'. Sand was saturated at ~4.3' and had a strong diesel-like odor.
6										6		
7										7		
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

Two 4

LOCATION OF BORING: <i>See Boring location Map</i>	PROJECT: CTO 0008 Site 333		BORING NO. SB07
	JOB NO. 7113		TOTAL DEPTH: 5'
	PROJ.MGR: G. Goode		LOGGED BY: G. Goode
	DRILLING CONTRACTOR: NA		EDITED BY: G. Goode
	DRILL RIG TYPE: NA		
	DRILLER'S NAME: NA		
	SAMPLING METHODS: Hand Auger		
	STARTED TIME: 12:00	DATE: 6/11/96	
	COMPLETED TIME: 12:15	DATE: 6/11/96	
	BORING DEPTH (ft.) 5'		
CASING DEPTH (ft.) NA			
WATER DEPTH (ft.) -			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	TEMPERATURE	WATER	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	
1										1		
2	HA	-	-	-	Dry	-	ND	NS	ND	2		
3										3	SM	
4	HA	-	-	-	Wet	-	ND	NS	ND	4		
5										5	SC	
6										6		
										7		
										8		
										9		

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

Permit #T9601496
Two 4

2 Sand, light gray, fine to medium grained & quartz, trace of silt, some fine to coarse shell fragments, loose, dry

4 Sand light brown, fine to medium grained, some silt of low plasticity, medium to coarse shell fragments, wet at 4.5' (oily sheen free like odor)

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

LOCATION OF BORING: See Soil Boring Location Map	PROJECT:	CTO 0008 Site 333	BORING NO.	SB08
	JOB NO.	7113	TOTAL DEPTH:	5.0'
	PROJ. MGR:	G. Goode	LOGGED BY:	G. Helms
	DRILLING CONTRACTOR:	NA	EDITED BY:	
	DRILL RIG TYPE:	NA		
	DRILLER'S NAME:	NA		
	SAMPLING METHODS:	hand auger		
	STARTED TIME:	1200	DATE:	6/11/96
	COMPLETED TIME:	1232	DATE:	6/11/96
	BORING DEPTH (R):	5.0'		
CASING DEPTH (R):	NA			
WATER DEPTH (R):	—			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through ~ 6 inches of concrete
2	HA	—	—	—	moist	—	0	0	0	2		SAND, lt. tan, fg-mg (predominantly mg, predominantly qtz, poorly graded, moist.
3										3	X SP	
4	HA	—	—	—	moist	—	0	0	0	4		SAND, lt. tan, fg-mg, (predominantly med grain), trace silt, predominant qtz, poorly graded, moist
5										5	X SP	to ~ 4.0', then wet. Sample taken from ~ 3.8' - 4.2'.
6										6		
7										7		* 5.0' - hit sandy SILT; fg;
8										8		no plasticity; SAT, oily sheen,
9										9		fuel like odor.

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

5809

LOCATION OF BORING: see soil boring location map	PROJECT: CTO 0008 Site 333		BORING NO. 333-TW06
	JOB NO. 7113		TOTAL DEPTH: 6.0
	PROJ. MGR: G. Goode		LOGGED BY: G. Helms
	DRILLING CONTRACTOR: NA		EDITED BY:
	DRILL RIG TYPE: NA		
	DRILLER'S NAME: NA		
	SAMPLING METHODS: hand auger		
	STARTED TIME: 1400		DATE: 6/11/96
	COMPLETED TIME: 1426		DATE: 6/11/96
	BORING DEPTH (ft.)		
CASING DEPTH (ft.) NA			
WATER DEPTH (ft.)			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through 6 inches of concrete before hand augering.
2	HA	-	-	-	moist	-	3	2	1	2		SAND, lt. gray, fg-mg qtz, some silt, well graded, moist, some organic material (dk gray) throughout
3										3	X	
4	HA	-	-	-	WET	-	5	2	3	4		SAND, lt. gray, fg-mg qtz, predominantly med. grained, poorly sorted, trace organic material, wet.
5					SAT					5	X	
6										6	X	
7										7		* 4.5'-5.0' - oil sheen in soils (SAT) 150 ppm w/ FID Sand was fine grained here, brownish little silt.
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

* previously SB09

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

SB10

LOCATION OF BORING:

See Soil Boring Location Map

PROJECT: CTO-0008 Site 333		BORING NO. 333-TW02
JOB NO. 7113		TOTAL DEPTH: 6.07' B.C.
PROJ. MGR: G. Goode	LOGGED BY: G. Helms	
DRILLING CONTRACTOR: NA	EDITED BY:	
DRILL RIG TYPE: NA		
DRILLER'S NAME: NA		
SAMPLING METHODS: hand auger		
STARTED TIME: 1620	DATE: 6/11/96	
COMPLETED TIME: 1652	DATE: 6/11/96	
BORING DEPTH (ft.): 5.0'		
CASING DEPTH (ft.): NA		
WATER DEPTH (ft.): -		

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored through ~ 6 inches of concrete prior to boring.
2	HA	-	-	-	moist	-	0	0	0	2		SAND, lt. tan, fg-mg predominantly qtz., w/some organic material
3										3	X SP	(dk gray to blk), predominantly med grained, poorly sorted, moist.
4	HA	-	-	-	wet	-	0	0	0	4		SAND, lt. gray, fg-mg qtz., some organic material, well graded, moist.
5										5	X SN	Towards bottom of sample sand is brown + coarser grained.
6										6		
7										7		5.0' - Sand, fine grained - med grained, lt. gray, trace silt, organic material (blk), SAT, well sorted, 0 ppm W/FID.
8										8		
9										9		

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

* Permit # T9601494

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 1

SB11

LOCATION OF BORING: see Soil Boring Location Map	PROJECT: CTO 0008 Site 333		BORING NO. 333-TWO3
	JOB NO. 7113		TOTAL DEPTH: 5.97 b/s
	PROJ.MGR: G. Goode		LOGGED BY: G. Helms
	DRILLING CONTRACTOR: NA		EDITED BY:
	DRILL RIG TYPE: NA		
	DRILLER'S NAME: NA		
	SAMPLING METHODS: hand auger		
	STARTED TIME: 1700	DATE: 6/11/96	
	COMPLETED TIME: 1722	DATE: 6/11/96	
	BORING DEPTH (ft): 5.0'		
	CASING DEPTH (ft): NA		
	WATER DEPTH (ft): -		

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		Cored ~ 6 inches of concrete prior to boring.
2	HA	-	-	-	moist	-	1	0	1	2		SAND, lt. gray, fg-mg predominantly med grained qtz, poorly sorted, moist.
3										3	X	
4	HA	-	-	-	WET	-	1	0	1	4		SAND, lt. tan, fg-mg, predominantly med qtz, poorly sorted, moist towards bottom of sample, sand becomes brown & has fg - some coarse grains, WET, more well graded, wet at 4.5'.
5										5	X	
6										6		
7										7		
8										8		
9										9		5.0' - SAND, lt. gray, fg-mg qtz, poorly sorted (mainly med. grains), SAT, some organics; FID reading 0ppm.

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

* Permit # T9601495

* SB11 (previous boring)

SOIL/SEDIMENT DESCRIPTION

LOG OF BORING

SB12

see Soil Boring Location Map

SOIL/SEDIMENT DESCRIPTION

* Permit # T9601497

* TW05 was previously SB12.

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 2

PCY-333-MW61

LOCATION OF BORING: See Site Soil boring Location Map	PROJECT: CTO 0008 Site 333		BORING NO.
	JOB NO. 7113		TOTAL DEPTH: 12.0
	PROJ. MGR: G. Goode		LOGGED BY: G. Helms
	DRILLING CONTRACTOR: Groundwater Protection		EDITED BY:
	DRILL RIG TYPE: D120C (Die drick)		
	DRILLER'S NAME: Charles Bucher		
	SAMPLING METHODS: hand auger / split spoon		
	STARTED TIME: 1713	DATE: 6/12/96	
	COMPLETED TIME:	DATE:	
	BORING DEPTH (ft)		
CASING DEPTH (ft)	NA		
WATER DEPTH (ft)	-		

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6 IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		SAND, brown, fg-mg, predominately mg, poorly graded; qtz.
2	HA	-	-	-	moist	-	0	0	0	2	X	
3										3	X	
4	HA	-	-	-	moist	-	0	0	0	4	X	SAND, brown (some lt. tan ~ 4.3') predominantly med. grained qtz; trace silt, moist.
5										5	X	
6	SS	5/6	24'		WET	-	0	0	0	6	X	SAND, lt. gray, fg-mg, qtz, little to no fines, well graded, some lenses of organic material from 5.0 - 5.5'.
7		5/5								7	X	
8										8		
9										9		
10												

ND = NO ORGANIC VAPORS DETECTED

NS = NO CARBON FILTERED SAMPLE READ

* previously SB10.

SOIL/SEDIMENT DESCRIPTION

PUC-333-MW01

PROJECT: 7113 NO. BORING NO.

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	SOIL/SEDIMENT DESCRIPTION
11	SS	2/1	24"	8"	WET		0	0	0	1	SP	
12		1/1								2	X	
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										0		
										1		
										2		
										3		
										4		
										5		
										6		
										7		
										8		
										9		
										0		

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 2

PCY-333-MW02

LOCATION OF BORING: See Soil Boring Location Map	PROJECT:	CTO 0008 Site 333	BORING NO.
	JOB NO.	7113	TOTAL DEPTH:
	PROJ.MGR:	G. Goode	LOGGED BY:
	DRILLING CONTRACTOR:	Groundwater Protection	EDITED BY:
	DRILL RIG TYPE:	D120 C (Diedrick)	
	DRILLER'S NAME:	Charles Bucher	
	SAMPLING METHODS:	HSA / Split Spoon	
	STARTED TIME:	1841	DATE:
	COMPLETED TIME:		DATE:
	BORING DEPTH (ft.)		
CASING DEPTH (ft.)	ADA-VM		
WATER DEPTH (ft.)	—		

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	
1										1		
2	HA	—	—	—	moist	—	0	0	0	2		
3										3	X SW	
4	HA	—	—	—	moist	—	8	2	6	4		
5										5	X SW	
6	5" / 2"	24" / 12"			WET	—	15000	5	4995	6	X	
7	3" / 3"									7	X SW	
8										8		
9										9		

Cored through 6 inches of concrete before augering.

SAND, lt. tan fg-mg, qtz, well graded, moist.

SAND, lt. tan fg-mg w/ abundant blk chunks of burnt wood, also abundant debris; overall color is dk gray to blk. More debris (fill) than sand, moist.

5.0' - 7.0' - blk, oily material with rounded pebbles, some silt, mixed in, odor is sweet, also pieces of burnt wood. Some fg sand.

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

SOIL/SEDIMENT DESCRIPTION

BROWN & ROOT ENVIRONMENTAL

LOG OF BORING

SHEET 1 OF 2

PCY-333-MW03

LOCATION OF BORING: see soil boring location map	PROJECT:	CTO 0008 Site 333	BORING NO.
	JOB NO.	7113	TOTAL DEPTH: 12.0'
	PROJ.MGR:	G. Goode	LOGGED BY: G. Helms
	DRILLING CONTRACTOR:	NA ^{VM} Groundwater Protection	EDITED BY:
	DRILL RIG TYPE:	NA ^{VM} D120 C (Diedrick)	
	DRILLER'S NAME:	Charles Bucher	
	SAMPLING METHODS:	HSA / Split Spoon	
	STARTED TIME:	0814	DATE: 6/18/96
	COMPLETED TIME:		DATE:
	BORING DEPTH (ft.)	12.0'	
CASING DEPTH (ft.)			
WATER DEPTH (ft.)			

SAMPLE DEPTH	SAMPLER TYPE	BLOWS/6-IN.	INCHES DRIVEN	INCHES RECOVERED	MOISTURE	ODOR	UNFILTERED OVA (PPM)	FILTERED OVA (PPM)	CORRECTED OVA (PPM)	DEPTH IN FEET	USCS CODE	SOIL/SEDIMENT DESCRIPTION
1										1		
2	HA	-	-	-	moist	-	0	0	0	2		SAND, -dk gray; fg - mg, qtz,
3										3	X SN	Some silt, well graded, qtz, some
4	HA	-	-	-	moist	-	0	0	0	4		lt. gray sand.
5										5	X P	SAND, -lt tan, fg - mg predominantly
6	SS	2/2	24"	24"	NET	-	0	0	0	6	X SN	med. grained qtz, poorly graded
7		3/4				-				7	X SN	little to no fines, moist
8										8		5.0' - 7.0' - Brown Sand to 5.5'
9										9		fg - mg, well graded qtz, becomes
10										10		lt. gray from 5.5' - 7.0' SAND,
												fg - mg well graded

ND = NO ORGANIC VAPORS DETECTED
NS = NO CARBON FILTERED SAMPLE READ

SOIL/SEDIMENT DESCRIPTION

PCY-333-MW03

DEPTH	TYPE	BLOWS	DRIVEN	REC'D	MOISTURE	ODOR	UNFILTER	FILTERED	CORRECT	DEPTH	USCS CODE	PROJECT:	NO.	BORING NO.
11	SS	9/9	24"	24"	26	-	19	60		1	X	With organic lenses from ~6.8' to 7.0'. Lenses are silty and ~1/8" - 1/4" in horizontal layers. 10'-12' - Silty SAND, fine grained some med grains, poorly graded, sand is qtz. Abundant organic material gives an overall dk gray color.		
12		7/11								2	X			
13										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				
										1				
										2				
										3				
										4				
										5				
										6				
										7				
										8				
										9				
										0				

SOIL/SEDIMENT DESCRIPTION

APPENDIX E

HEADSPACE METHODOLOGY FOR DETERMINING SOIL ORGANIC VAPOR CONCENTRATIONS

HEADSPACE METHODOLOGY FOR DETERMINING SOIL ORGANIC VAPOR CONCENTRATION

Soil headspace readings were obtained utilizing the following method which conforms to the requirements of Rule 62-770.200(2), FAC.

Two 16 ounce glass soil jars were half-filled with soil sample (duplicate samples). The soil jars were then sealed utilizing "mason jar" type open top screw on caps with foil in place of the conventional solid jar tops. The soil samples were allowed to equilibrate to ambient temperature which was within the FDEP temperature range.

The samples were tested with a Foxboro Century 128, an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID). Prior to each day's activities, the OVA was field calibrated with 100 ppm methane in air, in accordance with the manufacturer's specifications. Sample testing was performed by inserting the OVA probe through the foil sample cover and recording the highest OVA reading. Following collection of this OVA reading, the OVA was fitted with a granular activated carbon filter probe. The OVA was then used to test the headspace above the duplicate sample. Carbon absorbs petroleum hydrocarbons and thus the filtered reading is assumed to represent naturally occurring organic vapors.

Upon completion of the screening exercise, the carbon filtered result was subtracted from the unfiltered result, to obtain a net petroleum vapor value. In accordance with Rule 17(62)-770.200(2), F.A.C., and Guidelines for Assessment and Remediation of Petroleum Contaminated Soil (May 1994) corrected headspace levels in excess of 50 ppm is defined as excessively contaminated soil for diesel and used oil contaminated soil. Corrected headspace levels in excess of 10 ppm but less than 50 ppm are considered as contaminated, though not excessively contaminated.

APPENDIX F
WELL COMPLETION LOGS

WELL COMPLETION LOG

Water Mgmt. Dist.: NWFWMD

Permit Number:

Work Order: 6028

Type of Well: Monitor

Well Number: PCY333MW01

Method Used: 4 1/4" HSA

Borehole Dia. 8"

Site Information:

Name: CSS Panama City - Phase 1

Address: Site G9, 323 and 333

C,S,Z: Panama City, Florida

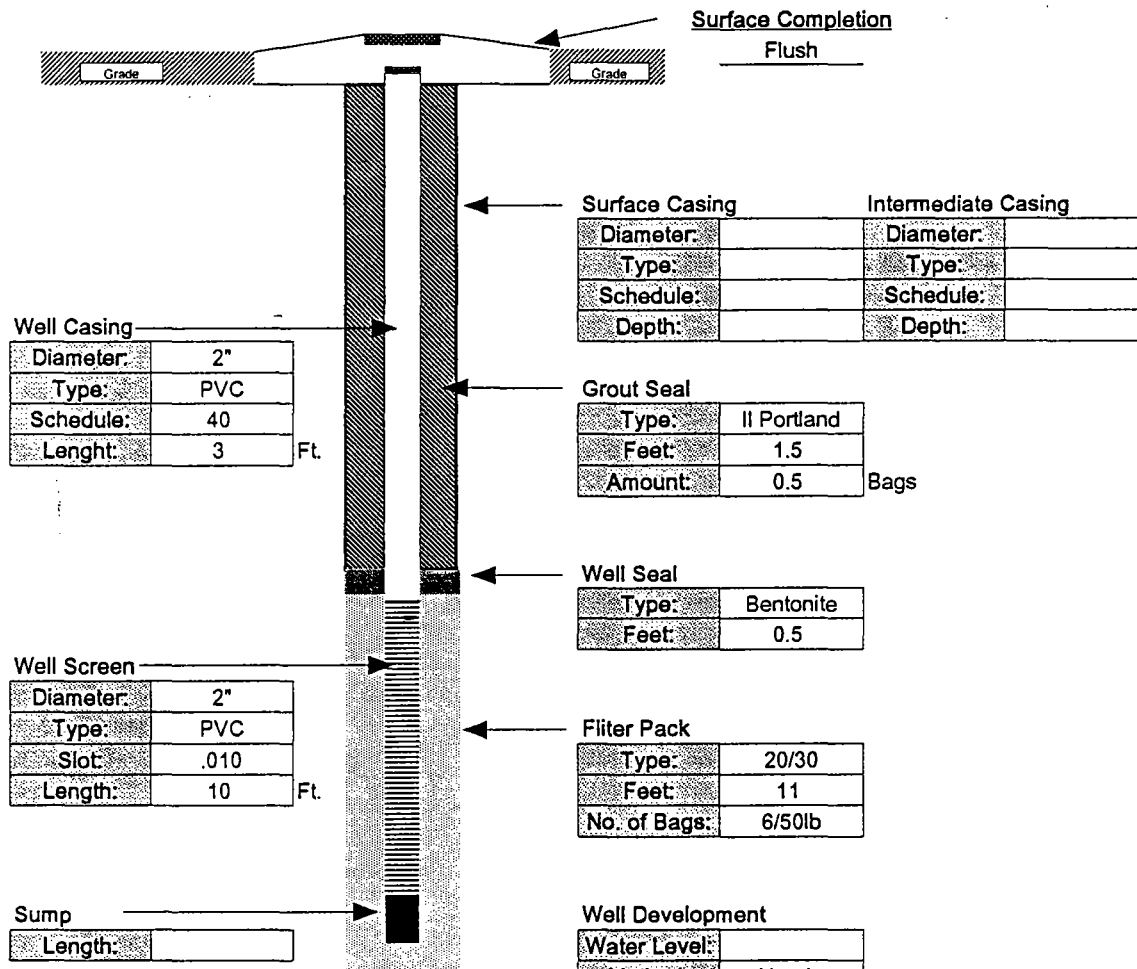
S/T/R:

Client / Consultant Information

Consultant: Brown & Root

Field Rep: Gerry Goode

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	13	10	3	0.5	6/50lb	20/30	Bentonite
40	← Schedule	Slot Size: →	.010		1.5	← Feet →	11	0.5



Contractor Information

Contractor #:	2633
Completion:	06/12/96
Driller:	Charles Bucher
Lead Hand:	Scott Robinson
3rd Man:	Todd Flick
Drill Rig:	D120C

Well Development

Water Level:			
Method:	Honda		
Start: ►	Dark	Finish: ►	Clear
Time:	30 Minutes		
GPM:			

Company: Groundwater Protection, Inc.
 Address: 4315 S.W. 34th Street
 C,S,Z: Orlando, Florida 32811
 Phone/FAX: (407) 426-7885 / (407) 426-7586

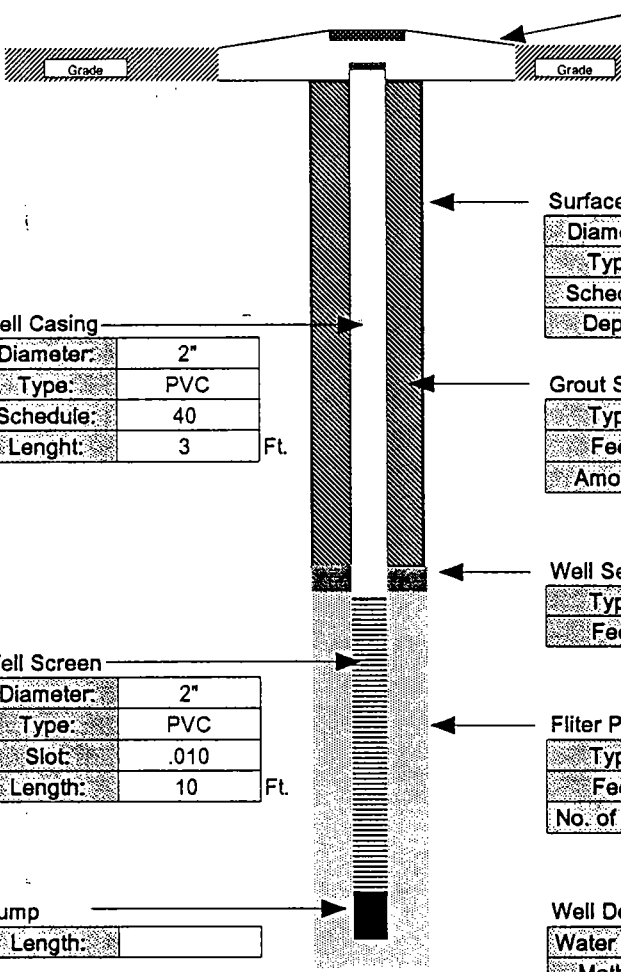
WELL COMPLETION LOG

Water Mgmt. Dist.: NWFWMD
 Permit Number:

Work Order: 6028
 Type of Well: Monitor
 Well Number: PCY333MW02
 Method Used: 4 1/4" HSA
 Borehole Dia. 8"

Site Information:
 Name: CSS Panama City - Phase 1
 Address: Site G9, 323 and 333
 C,S,Z: Panama City, Florida
 S/T/R:
Client / Consultant Information
 Consultant: Brown & Root
 Field Rep: Gerry Goode

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	13	10	3	0.5	6.5/50lb	20/30	Bentonite
40	← Schedule	Slot Size: →	.010		1.5	← Feet →	11	0.5



The diagram illustrates the well completion process. It shows a vertical well casing with a surface casing and an intermediate casing. The well casing is made of PVC with a diameter of 2 inches and a length of 3 feet. The well screen is also made of PVC with a diameter of 2 inches, a slot size of .010, and a length of 10 feet. The well is sealed with a grout seal and a well seal. The filter pack is made of sand with a type of 20/30 and a length of 11 feet. The well is developed using a Honda method, starting dark and finishing clear, taking 30 minutes. The well is completed with a sump.

Surface Completion
 Flush

Well Casing
 Diameter: 2"
 Type: PVC
 Schedule: 40
 Length: 3 Ft.

Surface Casing
 Diameter:
 Type:
 Schedule:
 Depth:

Intermediate Casing
 Diameter:
 Type:
 Schedule:
 Depth:

Grout Seal
 Type: II Portland
 Feet: 1.5
 Amount: 0.5 Bags

Well Seal
 Type: Bentonite
 Feet: 0.5

Well Screen
 Diameter: 2"
 Type: PVC
 Slot: .010
 Length: 10 Ft.

Filter Pack
 Type: 20/30
 Feet: 11
 No. of Bags: 6.5/50lb

Sump
 Length:

Well Development
 Water Level:
 Method: Honda
 Start: Dark Finish: Clear
 Time: 30 Minutes
 GPM:

Contractor Information

Contractor #:	2633
Completion:	06/12/96
Driller:	Charles Bucher
Lead Hand:	Scott Robinson
3rd Man:	Todd Flick
Drill Rig:	D120C

Company: Groundwater Protection, Inc.
 Address: 4315 S.W. 34th Street
 C,S,Z: Orlando, Florida 32811
 Phone/FAX: (407) 426-7885 / (407) 426-7586

WELL COMPLETION LOG

Water Mgmt. Dist.: NWFWMD

Permit Number:

Work Order: 6028

Type of Well: Monitor

Well Number: PCY333MW03

Method Used: 4 1/4" HSA

Borehole Dia. 8"

Site Information:

Name: CSS Panama City - Phase 1

Address: Site G9, 323 and 333

C,S,Z: Panama City, Florida

S/T/R:

Client / Consultant Information

Consultant: Brown & Root

Field Rep: Gerry Goode

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	13	10	3	0.5	6/50lb	20/30	Bentonite
40	← Schedule	Slot Size: →	.010		1.5	← Feet →	11	0.5

Well Casing

Diameter:	2"
Type:	PVC
Schedule:	40
Length:	3 Ft.

Well Screen

Diameter:	2"
Type:	PVC
Slot:	.010
Length:	10 Ft.

Sump

Length:	
---------	--

Surface Completion
Flush

Surface Casing		Intermediate Casing	
Diameter:		Diameter:	
Type:		Type:	
Schedule:		Schedule:	
Depth:		Depth:	

Grout Seal

Type:	II Portland
Feet:	1.5
Amount:	0.5 Bags

Well Seal

Type:	Bentonite
Feet:	0.5

Filter Pack

Type:	20/30
Feet:	11
No. of Bags:	6/50lb

Well Development

Water Level:			
Method:	Honda		
Start: →	Dark	Finish: →	Clear
Time:	30 Minutes		
GPM:			

Contractor Information

Contractor #:	2633
Completion:	06/13/96
Driller:	Charles Bucher
Lead Hand:	Scott Robinson
3rd Man:	Todd Flick
Drill Rig:	D120C

Company: Groundwater Protection, Inc.
 Address: 4315 S.W. 34th Street
 C,S,Z: Orlando, Florida 32811
 Phone/FAX: (407) 426-7885 / (407) 426-7586

WELL COMPLETION LOG

Water Mgmt. Dist.: NWFWMD

Permit Number:

Work Order: 6028

Type of Well: Monitor

Well Number: PCY333MW04

Method Used: 4 1/4" HSA

Borehole Dia. 8"

Site Information:

Name: CSS Panama City - Phase 1

Address: Site G9, 323 and 333

C,S,Z: Panama City, Florida

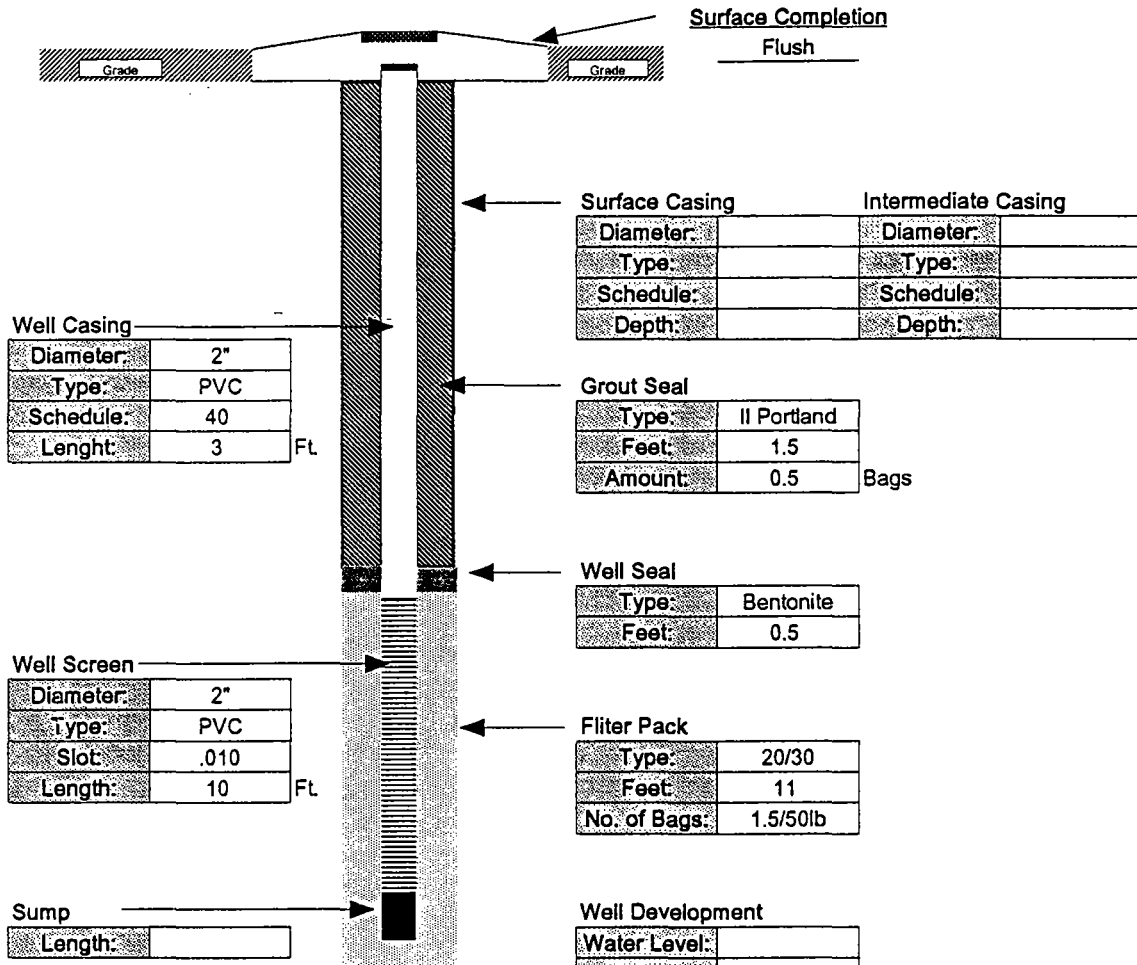
S/T/R:

Client / Consultant Information

Consultant: Brown & Root

Field Rep: Gerry Goode

Well Diameter	Well Type	Well Depth	Screen Length	Casing Length	Bags Grout	Sand Bags/Weight	Filter Type	Well Seal
2"	PVC	13	10	3	0.5	1.5/50lb	20/30	Bentonite
40	← Schedule	Slot Size: →	.010		1.5	← Feet →	11	0.5



Contractor Information

Contractor #:	2633
Completion:	06/13/96
Driller:	Charles Bucher
Lead Hand:	Scott Robinson
3rd Man:	Todd Flick
Drill Rig:	D120C

Well Development

Water Level:			
Method:	Honda		
Start: ►	Dark	Finish: ►	Clear
Time:	30 Minutes		
GPM:			

Company: Groundwater Protection, Inc.
 Address: 4315 S.W. 34th Street
 C,S,Z: Orlando, Florida 32811
 Phone/FAX: (407) 426-7885 / (407) 426-7586

APPENDIX G

GROUNDWATER GRADIENT, GROUNDWATER FLOW AND TRANSMISSIVITY CALCULATIONS

GROUNDWATER FLOW GRADIENT

The groundwater flow gradient was determined using the following equation

$$i = (h_1 - h_2)/d$$

where:

i = the hydraulic gradient

h_1 = the water elevation at point 1

h_2 = the water elevation at point 2

d = the distance between point 1 and point 2

The distance and groundwater elevations were obtained from Figure 3-2.

July 11, 1996

The gradient across the site was calculated after constructing groundwater contours from the July 11, 1996, depth to water data, determining the perpendicular distance between two of these contours, and utilizing the following calculation:

$$i = \frac{4.00 \text{ ft} - 2.50 \text{ ft}}{28 \text{ ft}}$$

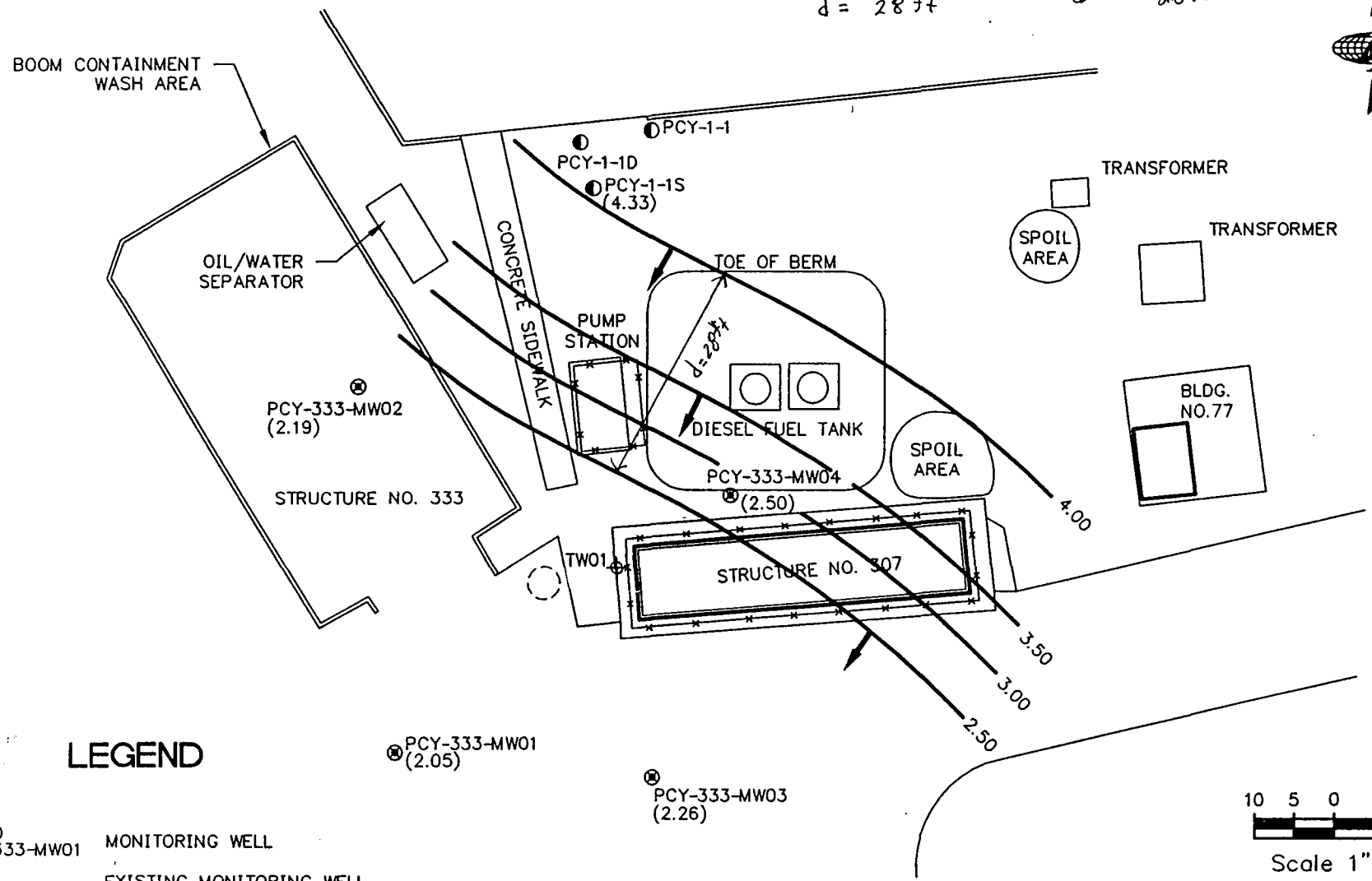
$$i = \frac{1.50 \text{ ft}}{28 \text{ ft}}$$

$$i = 0.05 \text{ ft/ft}$$

$$\Delta H = 1.57t$$

$$d = 287t$$

$$\frac{\Delta H}{d} = \frac{1.57t}{287t} = .05$$



LEGEND

- PCY-333-MW01 MONITORING WELL
- PCY-1-1 EXISTING MONITORING WELL
- GROUNDWATER FLOW DIRECTION
- GROUNDWATER CONTOUR
- GROUNDWATER ELEVATION

SITE MANAGER: GFG	CHECKED BY: PEC
DRAWN BY: TCB	DRAWING DATE: 1/14/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



Brown & Root Environmental

FIGURE 3-1
WATER TABLE ELEVATION CONTOUR MAP
 JULY 11, 1996 (SITE 333)
 COASTAL SYSTEMS STATION
 PANAMA CITY, FLORIDA

$$\Delta H = 0.1\cancel{9}4$$

$$d = 31\cancel{7}4$$

$$\frac{\Delta H}{d} = \frac{0.1\cancel{9}4}{31\cancel{7}4} = .002$$



BOOM CONTAINMENT
WASH AREA

OIL/WATER
SEPARATOR

PCY-333-MW02
(1.96)

STRUCTURE NO. 333

CONCRETE
SIDEWALK

PCY-1-1D
PCY-1-1S
(2.88)

PUMP
STATION

TOE OF BERM

DIESEL FUEL TANK.

PCY-333-MW04
(1.95)

SPOIL
AREA

STRUCTURE NO. 307

TRANSFORMER

TRANSFORMER

BLDG.
NO.77

LEGEND

PCY-333-MW01

MONITORING WELL

PCY-1-1

EXISTING MONITORING WELL



GROUNDWATER FLOW DIRECTION

2.00

GROUNDWATER CONTOUR

(1.88)

GROUNDWATER ELEVATION

PCY-333-MW01
(1.88)

PCY-333-MW03
(1.99)

1.90



Scale 1" = 20'

SITE MANAGER: GFG	CHECKED BY: PEC
DRAWN BY: TCB	DRAWING DATE: 1/14/97
SURVEYED BY: -	SURVEY DATE: -
SCALE: 1" = 20'	
CAD DWG. NO.: 7113-333	PROJ. NO.: 7113



Brown & Root Environmental

FIGURE 3-2
WATER TABLE ELEVATION CONTOUR MAP
NOVEMBER 25, 1996 (SITE 333)

COASTAL SYSTEMS STATION
PANAMA CITY, FLORIDA

GROUNDWATER FLOW VELOCITY

Potential movement of groundwater at the site may be described in terms of transportation by natural flow system in the saturated zone while assuming groundwater flow follows Darcy's Law. Darcy's Law may be expressed as:

$$V = \frac{(K \cdot i)}{n_e}$$

where:

V = average velocity

K = hydraulic conductivity (0.00498 ft/min or 7.1 ft/day)

i = hydraulic gradient (0.05ft/ft)

n_e = effective porosity

Therefore:

$$V = \frac{7.1 \text{ ft/day} \times 0.05 \text{ ft/ft}}{.30}$$

$$V = 1.18 \text{ ft/day}$$

TRANSMISSIVITY

Transmissivity can be determined by multiplying the hydraulic conductivity by the effective aquifer thickness (b_e). The effective aquifer thickness is defined as depth to the top of the water table to (approximately 5 feet bls) to the top of a sandy clay unit (identified in the study area at 27 ft bls) The transmissivity was calculated as follows:

$$T = K \cdot b_e$$

where:

T = transmissivity

K = hydraulic conductivity (7.1 ft/day)

b_e = affected aquifer thickness (22 ft)

$$T = 7.1 \text{ ft/day} \times 22 \text{ ft}$$

$$T = 156 \text{ ft}^2/\text{day}$$

APPENDIX H

FIELD MEASUREMENTS AND SAMPLING FORMS



SINGLE SAMPLE LOG SHEET

Page 1 of 1Project Site Name: CTO-0008 333Sample ID No.: 333-GW-PCY-155-001Project No.: 7113Sample Location: PCY-155

- ☐ Surface Soil
☐ Subsurface Soil
☐ Sediment
☒ Other Groundwater
☐ QA Sample Type: _____

Sampled By: C. Burgen

C.O.C. No.: _____

Sample Method:

Disposable Teflon Bailer

Depth Sampled:

5.15 TO 14.00

Sample Date and Time:

7-11-96/1530

Type of Sample

- ☒ Grab
☐ Composite
☐ Grab-Composite
☐ High Concentration
☐ Low Concentration

Composite Sample Data

Sample

Time

Color/Description

Grab Sample Data

Color

Description: (Sand, Clay, Dry, Moist, Wet, etc.)

Analysis	Container Requirements	Collected (✓)	Map:
<u>6001/6002</u>	<u>40ml</u>	<u>✓</u>	
<u>8260</u>	<u>40ml</u>	<u>✓</u>	
<u>504</u>	<u>125ml</u>	<u>✓</u>	
<u>Arsenic, cadmium, chromium</u>	<u>500ml</u>	<u>✓</u>	
<u>610</u>	<u>1 LITER</u>	<u>✓</u>	
<u>418.1</u>	<u>1 LITER</u>	<u>✓</u>	
<u>8270</u>	<u>2 LITER</u>	<u>✓</u>	
<u>239.2</u>	<u>500ml</u>	<u>✓</u>	

Observations/Notes:

Circle if Applicable:

MS/MSD

Duplicate ID No:

Signature(s):



SINGLE SAMPLE LOG SHEET

Page 1 of 1

Project Site Name: <u>CT-0008 333</u>		Sample ID No.: <u>333-GW-MW03-001</u>	
Project No.: <u>7113</u>		Sample Location: <u>MW03</u>	
<input type="checkbox"/> Surface Soil		Sampled By: <u>C. Bueger</u>	
<input type="checkbox"/> Subsurface Soil		C.O.C. No.: _____	
<input type="checkbox"/> Sediment			
<input checked="" type="checkbox"/> Other <u>Groundwater</u>			
<input type="checkbox"/> QA Sample Type: _____			

Sample Method:	Composite Sample Data		
	Sample	Time	Color/Description
<u>Disposable Teflon Bailers</u>			
Depth Sampled:			
<u>4.31 TO 12.35</u>			
Sample Date and Time:			
<u>7-1-96/1801</u>			
Type of Sample			
<input checked="" type="checkbox"/> Grab			
<input type="checkbox"/> Composite			
<input type="checkbox"/> Grab-Composite			
<input type="checkbox"/> High Concentration			
<input type="checkbox"/> Low Concentration			
	Grab Sample Data		
	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	

Analysis	Container Requirements	Collected (✓)	Map:
<u>601/602</u>	<u>40ml</u>	<u>✓</u>	
<u>8260</u>	<u>40ml</u>	<u>✓</u>	
<u>504</u>	<u>125ml</u>	<u>✓</u>	
<u>239.2</u>	<u>500ml</u>	<u>✓</u>	
<u>Arsenic, Cadmium, Chromium</u>	<u>500ml</u>	<u>✓</u>	
<u>8270</u>	<u>2 L. Ter</u>	<u>✓</u>	
<u>418.1</u>	<u>1 L. Ter</u>	<u>✓</u>	
<u>610</u>	<u>1 L. Ter</u>	<u>✓</u>	
Observations/Notes:			

Circle if Applicable:		Signature(s):
<u>MS/MSD</u>	Duplicate ID No.:	
	<u>333-GW-MW03-001D</u>	



SINGLE SAMPLE LOG SHEET

Page 1 of 1Project Site Name: CT-0005 333Sample ID No.: 333-GW-mw02-001Project No.: 7113Sample Location: mw02

- ☐ Surface Soil
☐ Subsurface Soil
☐ Sediment
☒ Other Groundwater
☐ QA Sample Type: _____

Sampled By: C. Burgin

C.O.C. No.: _____

Sample Method:

Composite Sample Data

Disposable Teflon Bailor

Sample

Time

Color/Description

Depth Sampled:

4.20 to 13.20

Sample Date and Time:

7-11-96 / 1602

Type of Sample

- ☒ Grab
☐ Composite
☐ Grab-Composite
☐ High Concentration
☐ Low Concentration

Grab Sample Data

Color

Description: (Sand, Clay, Dry, Moist, Wet, etc.)

Analysis	Container Requirements	Collected (✓)	Map:
<u>601/602</u>	<u>40 ml</u>	<u>✓</u>	
<u>8260</u>	<u>40 ml</u>	<u>✓</u>	
<u>504</u>	<u>125 ml</u>	<u>✓</u>	
<u>610</u>	<u>1 Liter</u>	<u>✓</u>	
<u>418.1</u>	<u>1 Liter</u>	<u>✓</u>	
<u>8270</u>	<u>2 Liter</u>	<u>✓</u>	
<u>239.2</u>	<u>500 ml</u>	<u>✓</u>	
<u>Arsenic cadmium chemilum</u>	<u>50 ml</u>	<u>✓</u>	

Observations/Notes:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No:



SINGLE SAMPLE LOG SHEET

Page 1 of 1Project Site Name: CTB-0005 333Sample ID No.: 333-GW-mw01-001Project No.: 7113Sample Location: mw01

- ☐ Surface Soil
☐ Subsurface Soil
☐ Sediment
☐ Other Groundwater
☐ QA Sample Type: _____

Sampled By: C. Burgin

C.O.C. No.: _____

Sample Method:

Disposable Teflon Bailor

Depth Sampled:

4.60 To 13.20

Sample Date and Time:

7-11-96/1714

Type of Sample

- ☒ Grab
☐ Composite
☐ Grab-Composite
☐ High Concentration
☐ Low Concentration

Composite Sample Data

Sample	Time	Color/Description

Grab Sample Data

Color	Description: (Sand, Clay, Dry, Moist, Wat, etc.)

Analysis	Container Requirements	Collected (✓)	Map:
601/602	40 ml	✓	
8260	40 ml	✓	
504	125 ml	✓	
418.1	1 liter	✓	
610	1 liter	✓	
231.2	500 ml	✓	
8270	2 liter	✓	
Arsenic, Cadmium, Chromium	500 ml	✓	

Observations/Notes:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No:

Sampler(s): C. Burr in

Facility Address: Coastal SYSTEM STATION PCY

SOP Cleaning	Y	N
--------------	---	---

TEST PARAMETERS

SAMPLOG.XLS

[illegible]

[illegible]



SINGLE SAMPLE LOG SHEET

Page 1 of 1Project Site Name: Coastal Systems StationSample ID No.: 333-6W-Two1-001BProject No.: 7113Sample Location: Blank

- ☐ Surface Soil
☐ Subsurface Soil
☐ Sediment
☐ Other Blank (groundwater)
☐ QA Sample Type: _____

Sampled By: Gerald GoodeC.O.C. No.: 0097Sample Method:
Bailer/Peristaltic Pump

Composite Sample Data

Depth Sampled:
- N/A

Sample

Time

Color/Description

-

-

ClearSample Date and Time:
11/25/96 / 12:15

Type of Sample

- ☐ Grab
☐ Composite
☐ Grab-Composite
☐ High Concentration
☐ Low Concentration

Grab Sample Data

Color

Description: (Sand, Clay, Dry, Moist, Wet, etc.)

Analysis

Container Requirements

Collected (✓)

Map:

601

40 ml vial, glass

✓

602

40 ml vial, glass

✓

8260

40 ml vial, glass

✓

610

1 L amber, glass

✓

8270

2 L amber, glass

✓

504

125 ml amber, glass

✓

Metals, Arsenic, Cadmium, Ch.

hazard 1 L plastic

✓

418.1 (TRPH)

1602 amber, glass

✓

NA

Observations/Notes:

Circle if Applicable:

MS/MSD

Duplicate ID No:

Signature(s):

Gerald Goode



SINGLE SAMPLE LOG SHEET

Page 1 of 1Project Site Name: Coastal Pipeline StationSample ID No.: 333-GW-MW04-001Project No.: 7113Sample Location: monitor well mw04

- ☐ Surface Soil
☐ Subsurface Soil
☐ Sediment
☒ Other Groundwater
☐ QA Sample Type: _____

Sampled By: Gerald GoodC.O.C. No.: 0097

Sample Method:	Composite Sample Data		
	Sample	Time	Color/Description
Depth Sampled: <u>water Table</u> <u>monitor well</u>	—	—	<u>clear/oily</u>
Sample Date and Time: <u>11/25/96 / 14:45</u>			
Type of Sample <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab-Composite <input type="checkbox"/> High Concentration <input type="checkbox"/> Low Concentration			
	Grab Sample Data		
	Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	

Analysis	Container Requirements	Collected (✓)	Map:
601	40 ml vial, glass	✓	
602	40 ml vial, glass	✓	
8260	40 ml vial, glass	✓	
610	1 Lamber, glass	✓	
8270	2 Lamber, glass	✓	
504	125 ml amber glass	✓	
metals, lead, arsenic, Cd, Chi.	1 L plastic	✓	
418.1 TRPIT	16 oz amber glass	✓	

Observations/Notes: Purge Free product layer .15' thickness from well prior to sampling

Circle if Applicable:

MS/MSD

Duplicate ID No:

Signature(s):

Gerald Good



SINGLE SAMPLE LOG SHEET

Page 1 of 1Project Site Name: Coastal System StationSample ID No.: 333-GW-Two1-001Project No.: 7113Sample Location: Monitor well Two1 Site 333

- ☐ Surface Soil
☐ Subsurface Soil
☐ Sediment
☐ Other Groundwater
☐ QA Sample Type: _____

Sampled By: Gerald GoodeC.O.C. No.: 0097Sample Method: Bailer/
Peristaltic pump

Composite Sample Data

Depth Sampled: water Table
— monitor well

Sample

Time

Color/Description

Sample Date and Time:

11/25/96 13:20

Type of Sample

- ☒ Grab
☐ Composite
☐ Grab-Composite
☐ High Concentration
☐ Low Concentration

Grab Sample Data

Color

Description: (Sand, Clay, Dry, Moist, Wet, etc.)

Analysis	Container Requirements	Collected <input checked="" type="checkbox"/>
601	40 ml vials, glass	<input checked="" type="checkbox"/>
602	40 ml vials, glass	<input checked="" type="checkbox"/>
8260	40 ml vials, glass	<input checked="" type="checkbox"/>
610	1 L amber, glass	<input checked="" type="checkbox"/>
8270	2 L amber, glass	<input checked="" type="checkbox"/>
504	125 ml amber, glass	<input checked="" type="checkbox"/>
Metals Atomic, head, Cd	Ch. 1 L plastic	<input checked="" type="checkbox"/>
418.1 (TRPH)	1 L plastic 1607 ml, glass	<input checked="" type="checkbox"/>

Map:

• pcy-15

• mwo2

• mwo4

• Two1

• mwo1

• mwo3

Observations/Notes:

Circle if Applicable:

MS/MSD

Duplicate ID No: Collected for
Laboratory QA/QC

Signature(s):

Gerald F. Goode

SINGLE SAMPLE LOG SHEET

APPENDIX I

GROUNDWATER FIELD SCREENING RESULTS

Detector "A" (		Attenuation -	1	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	0	Baseline -	0	Units -	PPM
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" (	PID)	Attenuation -	10	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	10	Baseline -	435	Units -	PPB
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		995	230570	1:17	
2	BENZENE	65.278	18847	2776070	1:40	
3	TOLUENE	100.000	23272	4290270	2:26	
4	ETHYLBENZENE	100.000	17408	2849640	3:54	
5	M, P-XYLENES	100.000	47235	11732860	4:05	
6	O-XYLENES	100.000	17802	4807930	4:39	

End of Result Report

Detector "A" (		Attenuation -	1	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	0	Baseline -	0	Units -	PPM
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" (	PID)	Attenuation -	10	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	5	Baseline -	472	Units -	PPB
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		1617	359050	1:10	
---	-----------------	--	------	--------	------	--

End of Result Report

Detector "A" (		)	Attenuation -	1	Min Area -	0
Segment Width -	10		Range -	1	Autorange -	1
Noise -	0		Baseline -	0	Units -	PPM
Detector Temp -	110 C		Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" (		PID)	Attenuation -	10	Min Area -	0
Segment Width -	10		Range -	1	Autorange -	1
Noise -	5		Baseline -	450	Units -	PPB
Detector Temp -	110 C		Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		2404	389360	1:11	
2	*** unknown ***		51	3760	2:19	
3	*** unknown ***		42	4370	7:48	
4	*** unknown ***		636	296710	9:34	

End of Result Report

Detector "A" (		)	Attenuation -	1	Min Area -	0
Segment Width -	10		Range -	1	Autorange -	1
Noise -	0		Baseline -	0	Units -	PPM
Detector Temp -	110 C		Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" (		PID)	Attenuation -	10	Min Area -	0
Segment Width -	10		Range -	1	Autorange -	1
Noise -	6		Baseline -	448	Units -	PPB
Detector Temp -	110 C		Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		493	75460	1:02	
---	-----------------	--	-----	-------	------	--

End of Result Report

Detector "A" ()
 Segment Width - 10
 Noise - 0
 Detector Temp - 110 C

Attenuation - 1
 Range - 1
 Baseline - 0
 Oven Temp - 70 C

Min Area - 0
 Autorange - 1
 Units - PPM

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" (PID)
 Segment Width - 10
 Noise - 4
 Detector Temp - 110 C

Attenuation - 10
 Range - 1
 Baseline - 459
 Oven Temp - 70 C

Min Area - 0
 Autorange - 1
 Units - PPB

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		1230	246220	1:07	
2	*** unknown ***		1360	268440	1:21	
3	*** unknown ***		1022	105040	1:27	
4	BENZENE	14.383	2480	375340	1:40	
5	*** unknown ***		4052	739640	1:46	
6	*** unknown ***		4693	1080400	2:02	
7	TOLUENE	19.473	6755	2043270	2:21	
8	TOLUENE	23.685	8216	1624710	2:33	
9	*** unknown ***		9024	2716680	2:51	
10	*** unknown ***		16225	5658260	3:26	
11	ETHYLBENZENE	136.917	27225	11990200	3:51	
12	M, P-XYLENES	43.166	18950	2073600	4:07	
13	*** unknown ***		18728	1490030	4:12	
14	*** unknown ***		20809	3384240	4:23	
15	O-XYLENES	169.125	26410	9177660	4:34	
16	*** unknown ***		23645	12258130	5:07	
17	*** unknown ***		22991	7956710	5:31	
18	*** unknown ***		33278	11998850	5:53	
19	*** unknown ***		35499	9988660	6:08	
20	*** unknown ***		41941	13670950	6:24	
21	*** unknown ***		46321	16226480	6:44	
22	*** unknown ***		60021	27244010	7:03	
23	*** unknown ***		49621	10712820	7:25	
24	*** unknown ***		43781	5237920	7:44	
25	*** unknown ***		55121	29073200	8:16	
26	*** unknown ***		31864	4751880	8:59	
27	*** unknown ***		28362	12062990	9:52	

End of Result Report

Detector "A" ()	Attenuation -	1	Min Area -	0
Segment Width - 10	Range -	1	Autorange -	1
Noise - 0	Baseline -	0	Units -	PPM
Detector Temp - 110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" ()	Attenuation -	10	Min Area -	0
Segment Width - 10	Range -	1	Autorange -	1
Noise - 7	Baseline -	444	Units -	PPB
Detector Temp - 110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		199	8960	1:02	
2	*** unknown ***		684	223150	1:14	
3	BENZENE	17.168	2702	403500	1:41	
4	TOLUENE	23.591	6326	1070260	2:27	
5	ETHYLBENZENE	17.729	2691	411150	3:54	
6	M, P-XYLENES	18.681	8201	2074860	4:06	
7	O-XYLENES	17.749	2759	686380	4:39	

End of Result Report

Detector "A" (		Attenuation -	1	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	0	Baseline -	0	Units -	PPM
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

Detector "B" (	PID)	Attenuation -	10	Min Area -	0
Segment Width -	10	Range -	1	Autorange -	1
Noise -	4	Baseline -	432	Units -	PPB
Detector Temp -	110 C	Oven Temp -	70 C		

Peak	Component Name	Concentration	Height	Area	Time	Alarm
------	----------------	---------------	--------	------	------	-------

1	*** unknown ***		734	192970	1:12	
2	BENZENE	6.182	1066	147720	1:38	
3	TOLUENE	12.116	4203	660110	2:23	
4	ETHYLBENZENE	3.852	766	109720	3:48	
5	M, P-XYLENES	5.961	2617	606770	3:59	
6	O-XYLENES	5.046	788	178930	4:31	

End of Result Report

APPENDIX J

GROUNDWATER LABORATORY DATA SHEETS

(Groundwater Samples Collected July 11 and November 25, 1996)

GROUNDWATER SAMPLES COLLECTED JULY 11, 1996

GC/MS VOLATILE ORGANICS

000001

**CASE NARRATIVE
GC/MS VOLATILE ORGANICS**

QAL Lab Reference No./SDG. MB370

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: N/A

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A

Cleanup: N/A

Analysis: SW-846 8260

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MB370 (MB370003MS and MB370003MSD). Please note that the relative percent recovery for 2-Chloroethylvinyl ether was above the advisory QC criteria. A copy of the results is provided for your review.

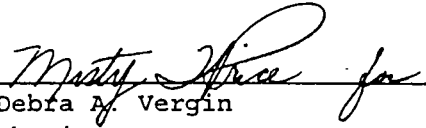
E. Samples: Sample analysis proceeded normally.

F. Other: Please note that the Form 1's reflect the specified target list.

Currently, there are not enough data points collected to produce control charts for the water surrogate recoveries for 1,2-Dichloroethane-d4. These charts are in the process of being developed.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED:  DATE: 8/7/96
Debra A. Vergin
Chemist

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MB370001	333-MW01-1	WATER	07/11/96	N/A	07/18/96	<2
MB370002	333-MW02-1	WATER	07/11/96	N/A	07/18/96	<2
MB370003	333-MW03-1	WATER	07/11/96	N/A	07/19/96	<2
MB370003MS	333-MW03-1MS	WATER	07/11/96	N/A	07/19/96	<2
MB370003MSD	333-MW03-1MD	WATER	07/11/96	N/A	07/19/96	<2
MB370004	333-PC4-1	WATER	07/11/96	N/A	07/19/96	<2
MB370005	333-MW01-1B	WATER	07/11/96	N/A	07/19/96	<2
MB370006	333-MW03-1D	WATER	07/11/96	N/A	07/19/96	<2
MB370007	TRIP_BLANK	WATER	07/11/96	N/A	07/18/96	<2
X07186B1	VBLK0S	WATER	N/A	N/A	07/18/96	N/A
X07196B1	VBLK0V	WATER	N/A	N/A	07/19/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8260 Extraction Method: _____

	MDL
	ug/L
Acetone	1.36
Acetonitrile	7.27
Acrolein	5.11
Acrylonitrile	4.90
Benzene	0.43
Bromobenzene	0.39
Bromochloromethane	0.32
Bromodichloromethane	0.39
Bromofluorobenzene	1.43
Bromoform	0.41
Bromomethane	0.50
2-Butanone	0.77
Carbon Disulfide	0.45
Carbon Tetrachloride	0.37
Chlorobenzene	0.53
Chloroethane	0.37
2-Chloroethylvinyl ether	0.39
Chloroform	0.21
Chloromethane	0.30
Chloroprene	0.73
3-Chloropropene	0.22
2-Chlorotoluene	1.11
4-Chlorotoluene	0.50
Cis-1,2-Dichloroethene	0.28
cis-1,3-Dichloropropene	0.26
Cyclohexanone	33.46
1,2-Dibromo-3-chloropropane	1.26
Dibromochloromethane	0.29
1,2-Dibromoethane	0.39
Dibromofluoromethane	1.97
Dibromomethane	0.42
1,2-Dichlorobenzene	0.66
1,3-Dichlorobenzene	0.61
1,4-Dichlorobenzene	0.65
Dichlorodifluoromethane	0.62
1,1-Dichloroethane	0.42
1,2-Dichloroethane	0.39
1,1-Dichloroethene	0.37
1,2-Dichloroethene (total)	0.48
Dichlorofluoromethane	0.35
1,2-Dichloropropane	0.39
1,3-Dichloropropane	0.28
2,2-Dichloropropane	0.23

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8260 Extraction Method: _____

	MDL
	ug/L
1,1-Dichloropropene	0.45
1,4-Dioxane	12.96
Ethyl ether	0.36
Ethyl methacrylate	0.51
Ethylbenzene	0.62
Hexachlorobutadiene	1.17
2-Hexanone	0.80
Iodomethane	1.47
Isobutyl alcohol	11.96
Isopropylbenzene	0.45
m-,p-Xylene	1.07
Methacrylonitrile	0.37
Methyl methacrylate	0.40
Methyl tert-butyl ether	0.27
4-Methyl-2-pentanone	0.39
Methylene Chloride	0.38
n-Butylbenzene	0.64
n-Propylbenzene	0.53
Naphthalene	2.30
o-Xylene	0.59
p-Isopropyltoluene	0.68
Pentachloroethane	0.31
Propionitrile	4.87
sec-Butylbenzene	0.51
Styrene	0.55
tert-Butylbenzene	0.46
1,1,1,2-Tetrachloroethane	0.33
1,1,2,2-Tetrachloroethane	0.78
Tetrachloroethene	0.46
Tetrahydrofuran	5.47
Toluene	0.45
Toluene-d8	1.26
trans-1,2-Dichloroethene	0.26
trans-1,3-Dichloropropene	0.43
trans-1,4-Dichloro-2-butene	0.58
1,1,2-Trichloro-1,2,2-trifluoroet	1.87
1,2,3-Trichlorobenzene	1.72
1,2,4-Trichlorobenzene	1.19
1,1,1-Trichloroethane	0.41
1,1,2-Trichloroethane	0.44
Trichloroethene	0.44
Trichlorofluoromethane	0.57
1,2,3-Trichloropropane	0.87

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS VOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: SW8260 Extraction Method:

	MDL
	ug/L
1,2,4-Trimethylbenzene	0.44
1,3,5-Trimethylbenzene	0.65
Vinyl acetate	1.16
Vinyl Chloride	0.37
Xylene (total)	1.59

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370001

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 18JUL0901009.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/18/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
156-60-5-----	trans-1,2-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	4	J
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

333-MW01-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370001

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 18JUL0901009.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/18/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 4

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 1825-61-2	Silane, methoxytrimethyl-	9.004	10	NJ
2.	Benzene, trimethyl- isomer	26.375	7	NJ
3.	Benzene, propenyl- isomer	27.969	7	NJ
4. 91-20-3	Naphthalene	32.110	30	NJ
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

QAL, Inc.

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071896a.b/18Jul0901009.d ✓
Lab Smp Id: MB370001 Client Smp ID: 333-MW01-1
Inj Date : 18-JUL-1996 19:32 Autotune Date: 18-Jul-96 11:10
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW01-1 MB370001
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 15:28 ms5 Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 9
Dil Factor: 1.000
Integrator: HP RTE
Target Version: 3.10

Compound Sublist: BROWN&ROOT.sub

Compounds	QUANT SIG						CONCENTRATIONS	
		MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (ug/L)	FINAL (ug/L)
-----	----	----	--	-----	-----	-----	-----	-----
* 1 Pentafluorobenzene	168.00	13.755	13.756	(1.000)	1709925	50		
3 Chloromethane	50.00				Compound Not Detected.			
4 Vinyl chloride	62.00				Compound Not Detected.			
5 Bromomethane	94.00				Compound Not Detected.			
6 Chloroethane	64.00				Compound Not Detected.			
7 Trichlorofluoromethane	101.00				Compound Not Detected.			
11 1,1-Dichloroethene	96.00				Compound Not Detected.			
16 Methylene chloride	84.00				Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00				Compound Not Detected.			
21 1,1-Dichloroethane	63.00				Compound Not Detected.			
31 Chloroform	83.00				Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00				Compound Not Detected.			
35 Carbon tetrachloride	117.00				Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	16.047	16.038	(1.000)	2186995	50		
37 1,2-Dichloroethane	62.00				Compound Not Detected.			
38 Benzene	78.00				Compound Not Detected.			
39 Trichloroethene	95.00				Compound Not Detected.			
41 1,2-Dichloropropane	63.00				Compound Not Detected.			
43 Bromodichloromethane	83.00				Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00				Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00				Compound Not Detected.			
* 48 Chlorobenzene-d5	117.00	22.382	22.372	(1.000)	1678156	50		
49 Toluene	91.00				Compound Not Detected.			
51 trans-1,3-Dichloropropene	75.00				Compound Not Detected.			
52 1,1,2-Trichloroethane	83.00				Compound Not Detected.			
55 Tetrachloroethene	166.00				Compound Not Detected.			
56 Dibromochloromethane	129.00				Compound Not Detected.			
58 Chlorobenzene	112.00				Compound Not Detected.			
60 Ethylbenzene	91.00	22.618	22.608	(1.011)	203237	4	4 (a)	
66 Bromoform	173.00				Compound Not Detected.			

Rev mps 8/5/96
000-09/2

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN	FINAL
	MASS					(ug/L)	(ug/L)
-----	----	--	-----	-----	-----	-----	-----
51 trans-1,3-Dichloropropene	75.00		19.874		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.169		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.779		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.162		Compound Not Detected.		
58 Chlorobenzene	112.00		22.461		Compound Not Detected.		
60 Ethylbenzene	91.00	22.618	22.608	(1.011)	203237	4	4 (a)
66 Bromoform	173.00		24.330		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.753		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.329	27.320	(1.000)	856526	50	
\$ 91 Dibromofluoromethane	113.00	13.775	13.766	(1.001)	924140	52	52
\$ 92 1,2-Dichloroethane-d4	65.00	15.024	15.005	(0.936)	374166	44	44
\$ 93 Toluene-d8	98.00	19.283	19.274	(1.202)	1937159	48	48
\$ 94 Bromofluorobenzene	174.00	24.909	24.890	(1.113)	785452	47	47

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

000013

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071896a.b/18Jul0901009.d
Lab Smp Id: MB370001 Client Smp ID: 333-MW01-1
Inj Date : 18-JUL-1996 19:32 Autotune Date: 18-Jul-96 11:10:3
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW01-1 MB370001
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 16:09 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 9
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
1 Pentafluorobenzene	13.755	7126628	50.000
* 69 1,4-Dichlorobenzene-d4	27.329	6312538	50.000

CONCENTRATIONS					QUANT		
RT	AREA	ON-COL(ug/L)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
----	----	-----	-----	----	-----	-----	-----
Silane, methoxytrimethyl-					CAS #: 1825-61-2		
9.004	1510295	10	10	91	NBS75K.1	63613	1
Benzene, trimethyl isomer					CAS #: 926-73-8 <i>ntp 8/5/95</i>		
26.375	931914	7	7	97	NBS75K.1	64573	69
Benzene, propenyl isomer					CAS #: 843-66-5 <i>ntp 8/5/95</i>		
27.969	851357	7	7	68	NBS75K.1	3599	69 (L)
Naphthalene					CAS #: 91-20-3		
32.110	3768250	30	30	97	NBS75K.1	65151	69

QC Flag Legend

L - Operator selected an alternate library search match.

000019

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.:

333-MW02-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370002

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 18JUL1001010.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/18/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	-----Chloromethane	10	U
75-01-4	-----Vinyl chloride	10	U
74-83-9	-----Bromomethane	10	U
75-00-3	-----Chloroethane	10	U
75-69-4	-----Trichlorofluoromethane	10	U
75-35-4	-----1,1-Dichloroethene	10	U
75-09-2	-----Methylene chloride	10	U
156-60-5	-----trans-1,2-Dichloroethene	10	U
75-34-3	-----1,1-Dichloroethane	10	U
67-66-3	-----Chloroform	10	U
71-55-6	-----1,1,1-Trichloroethane	10	U
56-23-5	-----Carbon tetrachloride	10	U
71-43-2	-----Benzene	10	U
107-06-2	-----1,2-Dichloroethane	10	U
79-01-6	-----Trichloroethene	10	U
78-87-5	-----1,2-Dichloropropane	10	U
75-27-4	-----Bromodichloromethane	10	U
110-75-8	-----2-Chloroethylvinyl ether	10	U
10061-01-5	-----cis-1,3-Dichloropropene	10	U
108-88-3	-----Toluene	10	U
10061-02-6	-----trans-1,3-Dichloropropene	10	U
79-00-5	-----1,1,2-Trichloroethane	10	U
127-18-4	-----Tetrachloroethene	10	U
124-48-1	-----Dibromochloromethane	10	U
108-90-7	-----Chlorobenzene	10	U
100-41-4	-----Ethylbenzene	10	U
75-25-2	-----Bromoform	10	U
79-34-5	-----1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

333-MW02-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370002

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 18JUL1001010.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/18/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.				
2.				
3.				
4.				
5.				
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25.				
26.				
27.				
28.				
29.				
30.				

QAL, Inc:

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071896a.b/18Jul1001010.d ✓
Lab Smp Id: MB370002 Client Smp ID: 333-MW02-1 ✓
Inj Date : 18-JUL-1996 20:12 ✓ Autotune Date: 18-Jul-96 11:10
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW02-1 MB370002
Misc Info : 5MLS ✓
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m ✓
Meth Date : 29-Jul-1996 15:28 ms5 Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d ✓
Als bottle: 10
Dil Factor: 1.000
Integrator: HP RTE
Target Version: 3.10
Compound Sublist: BROWN&ROOT.sub ✓

Compounds	QUANT SIG	MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
							ON-COLUMN	FINAL
							(ug/L)	(ug/L)
* 1 Pentafluorobenzene		168.00	13.752	13.756	(1.000)	1699238	50	
3 Chloromethane		50.00				Compound Not Detected.		
4 Vinyl chloride		62.00				Compound Not Detected.		
5 Bromomethane		94.00				Compound Not Detected.		
6 Chloroethane		64.00				Compound Not Detected.		
7 Trichlorofluoromethane		101.00				Compound Not Detected.		
11 1,1-Dichloroethene		96.00				Compound Not Detected.		
16 Methylene chloride		84.00				Compound Not Detected.		
19 trans-1,2-Dichloroethene		96.00				Compound Not Detected.		
21 1,1-Dichloroethane		63.00				Compound Not Detected.		
31 Chloroform		83.00				Compound Not Detected.		
33 1,1,1-Trichloroethane		97.00				Compound Not Detected.		
35 Carbon tetrachloride		117.00				Compound Not Detected.		
* 36 1,4-Difluorobenzene		114.00	16.044	16.038	(1.000)	2188187	50	
37 1,2-Dichloroethane		62.00				Compound Not Detected.		
38 Benzene		78.00				Compound Not Detected.		
39 Trichloroethene		95.00				Compound Not Detected.		
41 1,2-Dichloropropane		63.00				Compound Not Detected.		
43 Bromodichloromethane		83.00				Compound Not Detected.		
45 2-Chloroethylvinyl ether		63.00				Compound Not Detected.		
46 cis-1,3-Dichloropropene		75.00				Compound Not Detected.		
* 48 Chlorobenzene-d5		117.00	22.388	22.372	(1.000)	1706121	50	
49 Toluene		91.00				Compound Not Detected.		
51 trans-1,3-Dichloropropene		75.00				Compound Not Detected.		
52 1,1,2-Trichloroethane		83.00				Compound Not Detected.		
55 Tetrachloroethene		166.00				Compound Not Detected.		
56 Dibromochloromethane		129.00				Compound Not Detected.		
58 Chlorobenzene		112.00				Compound Not Detected.		
60 Ethylbenzene		91.00				Compound Not Detected.		

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN (ug/L)	FINAL (ug/L)
-----	----	--	-----	-----	-----	-----	-----
66 Bromoform	173.00		Compound Not Detected.				
68 1,1,2,2-Tetrachloroethane	83.00		Compound Not Detected.				
* 69 1,4-Dichlorobenzene-d4	152.00	27.326	27.320	(1.000)	863991	50	
\$ 91 Dibromofluoromethane	113.00	13.762	13.766	(1.001)	918645	52	52
\$ 92 1,2-Dichloroethane-d4	65.00	15.021	15.005	(0.936)	377640	45	45
\$ 93 Toluene-d8	98.00	19.290	19.274	(1.202)	1957658	48	48
\$ 94 Bromofluorobenzene	174.00	24.896	24.890	(1.112)	808644	48	48

000024

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071896a.b/18Jul1001010.d
Lab Smp Id: MB370002 Client Smp ID: 333-MW02-1
Inj Date : 18-JUL-1996 20:12 Autotune Date: 18-Jul-96 11:10:3
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW02-1 MB370002
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 16:09 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 10
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

000025

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370003

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0401004.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
156-60-5-----	trans-1,2-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

333-MW03-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370003

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0401004.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. _____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____
6. _____	_____	_____	_____	_____
7. _____	_____	_____	_____	_____
8. _____	_____	_____	_____	_____
9. _____	_____	_____	_____	_____
10. _____	_____	_____	_____	_____
11. _____	_____	_____	_____	_____
12. _____	_____	_____	_____	_____
13. _____	_____	_____	_____	_____
14. _____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____
16. _____	_____	_____	_____	_____
17. _____	_____	_____	_____	_____
18. _____	_____	_____	_____	_____
19. _____	_____	_____	_____	_____
20. _____	_____	_____	_____	_____
21. _____	_____	_____	_____	_____
22. _____	_____	_____	_____	_____
23. _____	_____	_____	_____	_____
24. _____	_____	_____	_____	_____
25. _____	_____	_____	_____	_____
26. _____	_____	_____	_____	_____
27. _____	_____	_____	_____	_____
28. _____	_____	_____	_____	_____
29. _____	_____	_____	_____	_____
30. _____	_____	_____	_____	_____

mtp/sv

Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071996a.b/19Jul0401004.d ✓
Lab Smp Id: MB370003 ✓ Client Smp ID: 333-MW03-1 ✓
Inj Date : 19-JUL-1996 11:57 Autotune Date: 19-Jul-96 09:48
Operator : WLH/RLW Inst ID: ms5.i ✓
Smp Info : 333-MW03-1 MB370003
Misc Info : 5MLS ✓
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m ✓
Meth Date : 29-Jul-1996 16:02 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d ✓
Als bottle: 4
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub ✓
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

						CONCENTRATIONS		
		QUANT	SIG			ON-COLUMN	FINAL	
Compounds		MASS	RT	EXP RT	REL RT	RESPONSE	(ug/L)	(ug/L)
*****		----	--	-----	-----	-----	-----	-----
*	1 Pentafluorobenzene	168.00	13.764	13.724	(1.000)	1694298	50	
	3 Chloꝛomethane	50.00		3.199		Compound Not Detected.		
	4 Vinyl chloride	62.00		3.524		Compound Not Detected.		
	5 Bromomethane	94.00		4.733		Compound Not Detected.		
	6 Chloroethane	64.00		5.048		Compound Not Detected.		
	7 Trichlorofluoromethane	101.00		5.806		Compound Not Detected.		
	11 1,1-Dichloroethene	96.00		7.566		Compound Not Detected.		
	16 Methylene chloride	84.00		9.012		Compound Not Detected.		
	19 trans-1,2-Dichloroethene	96.00		9.809		Compound Not Detected.		
	21 1,1-Dichloroethane	63.00		11.058		Compound Not Detected.		
	31 Chloroform	83.00		13.163		Compound Not Detected.		
	33 1,1,1-Trichloroethane	97.00		14.206		Compound Not Detected.		
	35 Carbon tetrachloride	117.00		14.786		Compound Not Detected.		
*	36 1,4-Difluorobenzene	114.00	16.046	16.025	(1.000)	2160075	50	
	37 1,2-Dichloroethane	62.00		15.219		Compound Not Detected.		
	38 Benzene	78.00		15.189		Compound Not Detected.		
	39 Trichloroethene	95.00		16.665		Compound Not Detected.		
	41 1,2-Dichloropropane	63.00		17.058		Compound Not Detected.		
	43 Bromodichloromethane	83.00		17.560		Compound Not Detected.		
	45 2-Chloroethylvinyl ether	63.00		18.386		Compound Not Detected.		
	46 cis-1,3-Dichloropropene	75.00		18.799		Compound Not Detected.		
*	48 Chlorobenzene-d5	117.00	22.381	22.370	(1.000)	1669608	50	
	49 Toluene	91.00		19.439		Compound Not Detected.		

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Compounds	QUANT SIG	CONCENTRATIONS					
		RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (ug/L)	FINAL (ug/L)
-----	----	--	-----	-----	-----	-----	-----
51 trans-1,3-Dichloropropene	75.00		19.871		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.157		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.776		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.160		Compound Not Detected.		
58 Chlorobenzene	112.00		22.458		Compound Not Detected.		
60 Ethylbenzene	91.00		22.606		Compound Not Detected.		
66 Bromoform	173.00		24.337		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.760		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.328	27.327	(1.000)	829303	50	
\$ 91 Dibromofluoromethane	113.00	13.764	13.743	(1.000)	861076	48	48
\$ 92 1,2-Dichloroethane-d4	65.00	15.013	14.993	(0.936)	329439	40	40
\$ 93 Toluene-d8	98.00	19.282	19.271	(1.202)	1878255	47	47
\$ 94 Bromofluorobenzene	174.00	24.899	24.888	(1.113)	751757	46	46

000030

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071996a.b/19Jul0401004.d
Lab Smp Id: MB370003 Client Smp ID: 333-MW03-1
Inj Date : 19-JUL-1996 11:57 Autotune Date: 19-Jul-96 09:48:4
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW03-1 MB370003
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m
Meth Date : 29-Jul-1996 16:02 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 4
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

000031

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-PC4-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370004

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0701007.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
156-60-5-----	trans-1,2-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

333-PC4-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370004

Sample wt/vol: 5.0

(g/mL) ML

Lab File ID: 19JUL0701007.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.				
2.				
3.				
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30.				

Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071996a.b/19Jul0701007.d ✓
Lab Smp Id: MB370004 ✓ Client Smp ID: 333-PC4-1 ✓
Inj Date : 19-JUL-1996 14:02 Autotune Date: 19-Jul-96 09:48
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-PC4-1 MB370004
Misc Info : 5MLS ✓
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m ✓
Meth Date : 29-Jul-1996 16:02 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d ✓
Als bottle: 7
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub ✓
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT	SIG	CONCENTRATIONS				
			ON-COLUMN	FINAL			
	MASS	RT	EXP RT	REL RT	RESPONSE	(ug/L)	(ug/L)
* 1 Pentafluorobenzene	168.00	13.761	13.724	(1.000)	1648174	50	
3 Chloromethane	50.00		3.199		Compound Not Detected.		
4 Vinyl chloride	62.00		3.524		Compound Not Detected.		
5 Bromomethane	94.00		4.733		Compound Not Detected.		
6 Chloroethane	64.00		5.048		Compound Not Detected.		
7 Trichlorofluoromethane	101.00		5.806		Compound Not Detected.		
11 1,1-Dichloroethene	96.00		7.566		Compound Not Detected.		
16 Methylene chloride	84.00		9.012		Compound Not Detected.		
19 trans-1,2-Dichloroethene	96.00		9.809		Compound Not Detected.		
21 1,1-Dichloroethane	63.00		11.058		Compound Not Detected.		
31 Chloroform	83.00		13.163		Compound Not Detected.		
33 1,1,1-Trichloroethane	97.00		14.206		Compound Not Detected.		
35 Carbon tetrachloride	117.00		14.786		Compound Not Detected.		
* 36 1,4-Difluorobenzene	114.00	16.043	16.025	(1.000)	2130537	50	
37 1,2-Dichloroethane	62.00		15.219		Compound Not Detected.		
38 Benzene	78.00		15.189		Compound Not Detected.		
39 Trichloroethene	95.00		16.665		Compound Not Detected.		
41 1,2-Dichloropropane	63.00		17.058		Compound Not Detected.		
43 Bromodichloromethane	83.00		17.560		Compound Not Detected.		
45 2-Chloroethylvinyl ether	63.00		18.386		Compound Not Detected.		
46 cis-1,3-Dichloropropene	75.00		18.799		Compound Not Detected.		
* 48 Chlorobenzene-d5	117.00	22.397	22.370	(1.000)	1655637	50	
49 Toluene	91.00		19.439		Compound Not Detected.		

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000035

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN (ug/L)	FINAL (ug/L)
-----	----	--	-----	-----	-----	-----	-----
51 trans-1,3-Dichloropropene	75.00		19.871		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.157		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.776		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.160		Compound Not Detected.		
58 Chlorobenzene	112.00		22.458		Compound Not Detected.		
60 Ethylbenzene	91.00		22.606		Compound Not Detected.		
66 Bromoform	173.00		24.337		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.760		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.335	27.327	(1.000)	828235	50	
\$ 91 Dibromofluoromethane	113.00	13.771	13.743	(1.001)	921140	53	53
\$ 92 1,2-Dichloroethane-d4	65.00	15.020	14.993	(0.936)	369928	45	45
\$ 93 Toluene-d8	98.00	19.289	19.271	(1.202)	1957457	49	49
\$ 94 Bromofluorobenzene	174.00	24.906	24.888	(1.112)	804497	49	49

000036

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071996a.b/19Jul0701007.d
Lab Smp Id: MB370004 Client Smp ID: 333-PC4-1
Inj Date : 19-JUL-1996 14:02 Autotune Date: 19-Jul-96 09:48:4
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-PC4-1 MB370004
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m
Meth Date : 29-Jul-1996 16:02 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 7
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

000037

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1B

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370005

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0501005.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
156-60-5-----	trans-1,2-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

333-MW01-1B

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370005

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0501005.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. _____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____
6. _____	_____	_____	_____	_____
7. _____	_____	_____	_____	_____
8. _____	_____	_____	_____	_____
9. _____	_____	_____	_____	_____
10. _____	_____	_____	_____	_____
11. _____	_____	_____	_____	_____
12. _____	_____	_____	_____	_____
13. _____	_____	_____	_____	_____
14. _____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____
16. _____	_____	_____	_____	_____
17. _____	_____	_____	_____	_____
18. _____	_____	_____	_____	_____
19. _____	_____	_____	_____	_____
20. _____	_____	_____	_____	_____
21. _____	_____	_____	_____	_____
22. _____	_____	_____	_____	_____
23. _____	_____	_____	_____	_____
24. _____	_____	_____	_____	_____
25. _____	_____	_____	_____	_____
26. _____	_____	_____	_____	_____
27. _____	_____	_____	_____	_____
28. _____	_____	_____	_____	_____
29. _____	_____	_____	_____	_____
30. _____	_____	_____	_____	_____

Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071996a.b/19Jul0501005.d ✓
Lab Smp Id: MB370005 ✓ Client Smp ID: 333-MW01-1B ✓
Inj Date : 19-JUL-1996 12:39 Autotune Date: 19-Jul-96 09:48
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW01-1B MB370005
Misc Info : SMLS ✓
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m ✓
Meth Date : 29-Jul-1996 16:02 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 ✓ Cal File: 10Jul2001020.d
Als bottle: 5
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub ✓
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT SIG	MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
							ON-COLUMN	FINAL
							(ug/L)	(ug/L)
* 1 Pentafluorobenzene		168.00	13.764	13.724	(1.000)	1645948	50	
3 Chloromethane		50.00		3.199		Compound Not Detected.		
4 Vinyl chloride		62.00		3.524		Compound Not Detected.		
5 Bromomethane		94.00		4.733		Compound Not Detected.		
6 Chloroethane		64.00		5.048		Compound Not Detected.		
7 Trichlorofluoromethane		101.00		5.806		Compound Not Detected.		
11 1,1-Dichloroethene		96.00		7.566		Compound Not Detected.		
16 Methylene chloride		84.00		9.012		Compound Not Detected.		
19 trans-1,2-Dichloroethene		96.00		9.809		Compound Not Detected.		
21 1,1-Dichloroethane		63.00		11.058		Compound Not Detected.		
31 Chloroform		83.00		13.163		Compound Not Detected.		
33 1,1,1-Trichloroethane		97.00		14.206		Compound Not Detected.		
35 Carbon tetrachloride		117.00		14.786		Compound Not Detected.		
* 36 1,4-Difluorobenzene		114.00	16.046	16.025	(1.000)	2122937	50	
37 1,2-Dichloroethane		62.00		15.219		Compound Not Detected.		
38 Benzene		78.00		15.189		Compound Not Detected.		
39 Trichloroethene		95.00		16.665		Compound Not Detected.		
41 1,2-Dichloropropane		63.00		17.058		Compound Not Detected.		
43 Bromodichloromethane		83.00		17.560		Compound Not Detected.		
45 2-Chloroethylvinyl ether		63.00		18.386		Compound Not Detected.		
46 cis-1,3-Dichloropropene		75.00		18.799		Compound Not Detected.		
* 48 Chlorobenzene-d5		117.00	22.391	22.370	(1.000)	1641119	50	

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Compounds	QUANT SIG	CONCENTRATIONS					
		RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (ug/L)	FINAL (ug/L)
-----	----	--	-----	-----	-----	-----	-----
49 Toluene	91.00	19.450	19.439	(0.869)	60197	1	
51 trans-1,3-Dichloropropene	75.00		19.871		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.157		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.776		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.160		Compound Not Detected.		
58 Chlorobenzene	112.00		22.458		Compound Not Detected.		
60 Ethylbenzene	91.00		22.606		Compound Not Detected.		
66 Bromoform	173.00		24.337		Compound Not Detected.		
68 1,1,1,2,2-Tetrachloroethane	83.00		24.760		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.328	27.327	(1.000)	824309	50	
\$ 91 Dibromofluoromethane	113.00	13.764	13.743	(1.000)	892257	52	52
\$ 92 1,2-Dichloroethane-d4	65.00	15.013	14.993	(0.936)	363691	44	44
\$ 93 Toluene-d8	98.00	19.292	19.271	(1.202)	1925246	49	49
\$ 94 Bromofluorobenzene	174.00	24.899	24.888	(1.112)	787391	49	49

below PQL
U2H
7/31/96

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

Data File: /chem/ms5.i/a071996a.b/19Jul0501005.d
Report Date: 29-Jul-1996 16:02

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Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071996a.b/19Jul0501005.d /
Lab Smp Id: MB370005 Client Smp ID: 333-MW01-1B
Inj Date : 19-JUL-1996 12:39 Autotune Date: 19-Jul-96 09:48:4
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW01-1B MB370005
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m
Meth Date : 29-Jul-1996 16:02 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 5
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

000043

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1D

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370006

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0601006.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
156-60-5-----	trans-1,2-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

333-MW03-1D

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370006

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 19JUL0601006.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/19/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

Quality Analytical Laboratories

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071996a.b/19Jul0601006.d ✓
Lab Smp Id: MB370006 ✓ Client Smp ID: 333-MW03-1D ✓
Inj Date : 19-JUL-1996 13:20 Autotune Date: 19-Jul-96 09:48
Operator : WLH/RLW Inst ID: ms5.i ✓
Smp Info : 333-MW03-1D MB370006
Misc Info : 5MLS ✓
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m ✓
Meth Date : 29-Jul-1996 16:02 whall Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d ✓
Als bottle: 6
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub ✓
Target Version: 3.12
Concentration Formula: Uf * 5/Vo

Name	Value	Description
Uf	1.000	ng unit correction factor
Vo	5.000	Sample Volume purged (mL)

Compounds	QUANT SIG	MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
							ON-COLUMN	FINAL
							(ug/L)	(ug/L)
* 1 Pentafluorobenzene	168.00	13.765	13.724	(1.000)	1653073	50		
3 Chloromethane	50.00		3.199		Compound Not Detected.			
4 Vinyl chloride	62.00		3.524		Compound Not Detected.			
5 Bromomethane	94.00		4.733		Compound Not Detected.			
6 Chloroethane	64.00		5.048		Compound Not Detected.			
7 Trichlorofluoromethane	101.00		5.806		Compound Not Detected.			
11 1,1-Dichloroethene	96.00		7.566		Compound Not Detected.			
16 Methylene chloride	84.00		9.012		Compound Not Detected.			
19 trans-1,2-Dichloroethene	96.00		9.809		Compound Not Detected.			
21 1,1-Dichloroethane	63.00		11.058		Compound Not Detected.			
31 Chloroform	83.00		13.163		Compound Not Detected.			
33 1,1,1-Trichloroethane	97.00		14.206		Compound Not Detected.			
35 Carbon tetrachloride	117.00		14.786		Compound Not Detected.			
* 36 1,4-Difluorobenzene	114.00	16.047	16.025	(1.000)	2134849	50		
37 1,2-Dichloroethane	62.00		15.219		Compound Not Detected.			
38 Benzene	78.00		15.189		Compound Not Detected.			
39 Trichloroethene	95.00		16.665		Compound Not Detected.			
41 1,2-Dichloropropane	63.00		17.058		Compound Not Detected.			
43 Bromodichloromethane	83.00		17.560		Compound Not Detected.			
45 2-Chloroethylvinyl ether	63.00		18.386		Compound Not Detected.			
46 cis-1,3-Dichloropropene	75.00		18.799		Compound Not Detected.			
* 48 Chlorobenzene-d5	117.00	22.391	22.370	(1.000)	1654485	50		
49 Toluene	91.00		19.439		Compound Not Detected.			

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Compounds	QUANT SIG MASS	RT	CONCENTRATIONS			ON-COLUMN (ug/L)	FINAL (ug/L)
			EXP RT	REL RT	RESPONSE		
51 trans-1,3-Dichloropropene	75.00		19.871		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.157		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.776		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.160		Compound Not Detected.		
58 Chlorobenzene	112.00		22.458		Compound Not Detected.		
60 Ethylbenzene	91.00		22.606		Compound Not Detected.		
66 Bromoform	173.00		24.337		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.760		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.329	27.327	(1.000)	829727	50	
\$ 91 Dibromofluoromethane	113.00	13.775	13.743	(1.001)	912489	53	53
\$ 92 1,2-Dichloroethane-d4	65.00	15.024	14.993	(0.936)	367756	45	45
\$ 93 Toluene-d8	98.00	19.283	19.271	(1.202)	1934736	49	49
\$ 94 Bromofluorobenzene	174.00	24.900	24.888	(1.112)	792172	48	48

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071996a.b/19Jul0601006.d
Lab Smp Id: MB370006 Client Smp ID: 333-MW03-1D
Inj Date : 19-JUL-1996 13:20 Autotune Date: 19-Jul-96 09:48:4
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : 333-MW03-1D MB370006
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071996a.b/8260w5.m
Meth Date : 29-Jul-1996 16:02 whall
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 6
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP_BLANK

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370007

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 18JUL0801008.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Date Analyzed: 07/18/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	5	J
156-60-5-----	trans-1,2-Dichloroethene	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TRIP_BLANK

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370007

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: 18JUL0801008.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____

Data Analyzed: 07/18/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.				
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QAL, Inc:

VOLATILE REPORT METHOD 8260/5-ML PURGE

Data file : /chem/ms5.i/a071896a.b/18Jul0801008.d ✓
Lab Smp Id: MB370007 ✓ Client Smp ID: TRIP BLANK -
Inj Date : 18-JUL-1996 18:51 Autotune Date: 18-Jul-96 11:10
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : TRIP BLANK MB370007
Misc Info : 5MLS ✓
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m ✓
Meth Date : 29-Jul-1996 15:28 ms5 Quant Type: ISTD
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d ✓
Dil bottle: 8
Dil Factor: 1.000 ✓
Integrator: HP RTE
Target Version: 3.10

Compound Sublist: BROWN&ROOT.sub

Compounds	QUANT SIG						CONCENTRATIONS	
		MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (ug/L)	FINAL (ug/L)
*****	----	----	--	-----	-----	-----	-----	-----
* 1 Pentafluorobenzene		168.00	13.755	13.756	(1.000)	1717586	50	
3 Chloromethane		50.00				Compound Not Detected.		
4 Vinyl chloride		62.00				Compound Not Detected.		
5 Bromomethane		94.00				Compound Not Detected.		
6 Chloroethane		64.00				Compound Not Detected.		
7 Trichlorofluoromethane		101.00				Compound Not Detected.		
11 1,1-Dichloroethene		96.00				Compound Not Detected.		
16 Methylene chloride		84.00	9.034	9.034	(0.657)	68000	5	5
19 trans-1,2-Dichloroethene		96.00				Compound Not Detected.		
21 1,1-Dichloroethane		63.00				Compound Not Detected.		
31 Chloroform		83.00				Compound Not Detected.		
33 1,1,1-Trichloroethane		97.00				Compound Not Detected.		
35 Carbon tetrachloride		117.00				Compound Not Detected.		
* 36 1,4-Difluorobenzene		114.00	16.037	16.038	(1.000)	2179707	50	
37 1,2-Dichloroethane		62.00				Compound Not Detected.		
38 Benzene		78.00				Compound Not Detected.		
39 Trichloroethene		95.00				Compound Not Detected.		
41 1,2-Dichloropropane		63.00				Compound Not Detected.		
43 Bromodichloromethane		83.00				Compound Not Detected.		
45 2-Chloroethylvinyl ether		63.00				Compound Not Detected.		
46 cis-1,3-Dichloropropene		75.00				Compound Not Detected.		
* 48 Chlorobenzene-d5		117.00	22.382	22.372	(1.000)	1718605	50	
49 Toluene		91.00				Compound Not Detected.		
51 trans-1,3-Dichloropropene		75.00				Compound Not Detected.		
52 1,1,2-Trichloroethane		83.00				Compound Not Detected.		
55 Tetrachloroethene		166.00				Compound Not Detected.		
56 Dibromochloromethane		129.00				Compound Not Detected.		
58 Chlorobenzene		112.00				Compound Not Detected.		
60 Ethylbenzene		91.00				Compound Not Detected.		

Rev mp 8/5/96
000054 7/29/96

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN	FINAL
	MASS					(ug/L)	(ug/L)
-----	----	--	-----	-----	-----	-----	-----
51 trans-1,3-Dichloropropene	75.00		19.874		Compound Not Detected.		
52 1,1,2-Trichloroethane	83.00		20.169		Compound Not Detected.		
55 Tetrachloroethene	166.00		20.779		Compound Not Detected.		
56 Dibromochloromethane	129.00		21.162		Compound Not Detected.		
58 Chlorobenzene	112.00		22.461		Compound Not Detected.		
60 Ethylbenzene	91.00		22.608		Compound Not Detected.		
66 Bromoform	173.00		24.330		Compound Not Detected.		
68 1,1,2,2-Tetrachloroethane	83.00		24.753		Compound Not Detected.		
* 69 1,4-Dichlorobenzene-d4	152.00	27.329	27.320	(1.000)	868353	50	
\$ 91 Dibromofluoromethane	113.00	13.775	13.766	(1.001)	922258	51	51
\$ 92 1,2-Dichloroethane-d4	65.00	15.014	15.005	(0.936)	385525	46	46
\$ 93 Toluene-d8	98.00	19.283	19.274	(1.202)	1938486	48	48
\$ 94 Bromofluorobenzene	174.00	24.900	24.890	(1.113)	810014	48	48

000055

Quality Analytical Laboratories

Unknown Compounds Quantitation Report

Data file : /chem/ms5.i/a071896a.b/18Jul0801008.d
Lab Smp Id: MB370007 Client Smp ID: TRIP BLANK
Inj Date : 18-JUL-1996 18:51 Autotune Date: 18-Jul-96 11:10:3
Operator : WLH/RLW Inst ID: ms5.i
Smp Info : TRIP BLANK MB370007
Misc Info : 5MLS
Comment :
Method : /chem/ms5.i/a071896a.b/8260w5.m
Meth Date : 29-Jul-1996 15:28 ms5
Cal Date : 10-JUL-1996 22:29 Cal File: 10Jul2001020.d
Als bottle: 8
Dil Factor: 1.000 Target Version: 3.12
Integrator: HP RTE Compound Sublist: BROWN&ROOT.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

- NO TENTATIVELY IDENTIFIED COMPOUNDS -

000057

GC/MS SEMIVOLATILE ORGANICS

**CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS**

QAL Lab Reference No./SDG. MB370

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: SW-846 3520A

Cleanup: N/A

Analysis: SW-846 8270A

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MB370 (MB370003MS and MB370003MSD). Please note that the relative percent recoveries for 4-Nitrophenol were above the advisory QC criteria in the matrix spike and matrix spike duplicate. All other advisory criteria were met. A copy of the results is provided for your review.

E. Samples: Sample analysis proceeded normally.

F. Other: Please note that the Form 1's reflect the specified target list and that Azobenzene is reported as 1,2-Diphenylhydrazine.

A summary of the most current applicable method detection limits (MDLs) immediately follows the case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Debra A. Vergin for DATE: 8/8/96
Debra A. Vergin
Chemist

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MB370001	333-MW01-1	WATER	07/11/96	07/16/96	07/25/96	N/A
MB370002	333-MW02-1	WATER	07/11/96	07/16/96	07/26/96	N/A
MB370003	333-MW03-1	WATER	07/11/96	07/16/96	07/25/96	N/A
MB370003MS	333-MW03-1MS	WATER	07/11/96	07/16/96	07/25/96	N/A
MB370003MSD	333-MW03-1MD	WATER	07/11/96	07/16/96	07/25/96	N/A
MB370004	333-PC4-1	WATER	07/11/96	07/16/96	07/25/96	N/A
MB370005	333-MW01-1B	WATER	07/11/96	07/16/96	07/24/96	N/A
MB370006	333-MW03-1D	WATER	07/11/96	07/16/96	07/25/96	N/A
C07166B1	SBLK7S	WATER	N/A	07/16/96	07/24/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8270 Extraction Method: SW3520

	MDL
	ug/L
Acenaphthene	0.43
Acenaphthylene	0.41
Acetophenone	0.47
2-Acetylaminofluorene	0.68
4-Aminobiphenyl	0.31
Aniline	0.70
Anthracene	0.46
Aramite	1.28
Aramite (DUP)	0.54
Benzidine	2.78
Benzo (a) anthracene	0.34
Benzo (a) pyrene	0.31
Benzo (b) fluoranthene	0.68
Benzo (g,h,i) perylene	0.72
Benzo (k) fluoranthene	0.65
Benzoic acid	10.32
Benzyl alcohol	0.51
bis (2-Chloroethoxy) methane	0.60
bis (2-Chloroethyl) ether	0.61
bis (2-Ethylhexyl) phthalate	4.51
4-Bromophenyl-phenylether	0.56
Butylbenzylphthalate	1.25
Carbazole	0.56
4-Chloro-3-Methylphenol	2.28
4-Chloroaniline	0.47
1-Chloronaphthalene	0.68
2-Chloronaphthalene	0.53
2-Chlorophenol	0.78
4-Chlorophenyl-phenylether	0.35
Chrysene	0.36
Di-n-butylphthalate	1.24
Di-n-octylphthalate	1.45
Dibenz (a,h) anthracene	0.54
Dibenzofuran	0.43
1,2-Dichlorobenzene	0.75
1,3-Dichlorobenzene	0.73
1,4-Dichlorobenzene	0.79
3,3'-Dichlorobenzidine	0.67
2,4-Dichlorophenol	0.54
2,6-Dichlorophenol	0.62
Diethylphthalate	1.61
7,12-Dimethylbenz (a) anthracen	0.36
3,3'-Dimethylbenzidine	4.96

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8270 Extraction Method: SW3520

	MDL
	ug/L
2,4-Dimethylphenol	0.44
Dimethylphthalate	1.69
4,6-Dinitro-2-methylphenol	1.36
1,3-Dinitrobenzene	0.85
2,4-Dinitrophenol	1.91
2,4-Dinitrotoluene	0.54
2,6-Dinitrotoluene	0.53
1,2-Diphenylhydrazine	0.42
Ethyl methanesulfonate	0.42
Fluoranthene	0.81
Fluorene	0.53
Hexachlorobenzene	1.10
Hexachlorobutadiene	0.90
Hexachlorocyclopentadiene	1.98
Hexachloroethane	0.79
Hexachlorophene	131.38
Hexachloropropene	1.81
Indeno (1,2,3-cd)pyrene	0.46
Isophorone	0.61
Isosafrole	0.39
Methapyrilene	6.24
Methyl methanesulfonate	0.42
3-Methylcholanthrene	0.50
2-Methylnaphthalene	0.62
2-Methylphenol	0.42
3 & 4-Methylphenol	1.14
N-Nitroso-di-n-butylamine	0.41
N-Nitroso-di-n-propylamine	0.72
N-Nitrosodiethylamine	0.31
N-Nitrosodimethylamine	0.60
N-Nitrosodiphenylamine (1)	0.95
N-Nitrosomethylethylamine	0.43
N-Nitrosomorpholine	0.65
N-Nitrosopiperidine	0.40
N-Nitrosopyrrolidine	0.48
Naphthalene	0.68
1,4-Naphthoquinone	123.50
1-Naphthylamine	1.38
2-Naphthylamine	0.81
5-Nitro-o-toluidine	0.64
2-Nitroaniline	1.34
3-Nitroaniline	1.03
4-Nitroaniline	1.39

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC/MS SEMIVOLATILE ORGANICS

Laboratory Name: CH2M HILL Sample Matrix: WATER
Analytical Method: SW8270 Extraction Method: SW3520

	MDL
	ug/L
Nitrobenzene	0.57
2-Nitrophenol	1.23
4-Nitrophenol	1.44
4-Nitroquinoline-1-oxide	2.02
o-Toluidine	0.30
2,2'-Oxybis(1-chloropropane)	0.51
p-Dimethylaminoazobenzene	0.62
Pentachlorobenzene	0.54
Pentachloronitrobenzene	0.28
Pentachlorophenol	2.51
Phenacetin	0.83
Phenanthrene	0.42
Phenol	0.53
Phenyl-tert-butylamine	25.65
1,4-Phenylenediamine	23.31
2-Picoline	1.03
Pronamide	0.65
Pyrene	0.43
Pyridine	0.87
Safrole	0.50
1,2,4,5-Tetrachlorobenzene	0.79
2,3,4,6-Tetrachlorophenol	1.01
1,2,4-Trichlorobenzene	0.72
2,4,5-Trichlorophenol	0.70
2,4,6-Trichlorophenol	0.66
1,3,5-Trinitrobenzene	0.65

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006699.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9-----	N-Nitrosodimethylamine_____	10	U
108-95-2-----	Phenol_____	10	U
111-44-4-----	bis(2-Chloroethyl) ether_____	10	U
95-57-8-----	2-Chlorophenol_____	10	U
541-73-1-----	1,3-Dichlorobenzene_____	10	U
106-46-7-----	1,4-Dichlorobenzene_____	10	U
95-50-1-----	1,2-Dichlorobenzene_____	10	U
108-60-1-----	2,2'-oxybis(1-Chloroprop (1)_____	10	U
621-64-7-----	N-Nitroso-di-n-propylamine_____	10	U
67-72-1-----	Hexachloroethane_____	10	U
98-95-3-----	Nitrobenzene_____	10	U
78-59-1-----	Isophorone_____	10	U
88-75-5-----	2-Nitrophenol_____	10	U
105-67-9-----	2,4-Dimethylphenol_____	10	U
111-91-1-----	bis(2-Chloroethoxy) methane_____	10	U
120-83-2-----	2,4-Dichlorophenol_____	10	U
120-82-1-----	1,2,4-Trichlorobenzene_____	10	U
91-20-3-----	Naphthalene_____	10	U
87-68-3-----	Hexachlorobutadiene_____	10	U
59-50-7-----	4-Chloro-3-methylphenol_____	10	U
88-06-2-----	2,4,6-Trichlorophenol_____	10	U
91-58-7-----	2-Chloronaphthalene_____	10	U
131-11-3-----	Dimethylphthalate_____	10	U
606-20-2-----	2,6-Dinitrotoluene_____	10	U
208-96-8-----	Acenaphthylene_____	10	U
83-32-9-----	Acenaphthene_____	10	U
51-28-5-----	2,4-Dinitrophenol_____	50	U
100-02-7-----	4-Nitrophenol_____	50	U
121-14-2-----	2,4-Dinitrotoluene_____	10	U
84-66-2-----	Diethylphthalate_____	10	U
86-73-7-----	Fluorene_____	10	U
7005-72-3-----	4-Chlorophenyl-phenylether_____	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000162

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006699.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	50	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000163

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006699.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

Number TICs found: 12

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 111-76-2	Ethanol, 2-butoxy-	5.713	4	NJ
2.	Unknown	8.995	2	J
3.	Unknown	9.611	3	J
4. 28134-31-8	Benzoic acid, ethyl-	9.955	5	NJ
5.	Unknown	10.204	2	J
6.	Unknown	12.608	2	J
7.	Unknown	13.121	4	J
8. 1321-74-0	Benzene, diethenyl-	14.176	2	NJ
9. 86-87-3	1-Naphthaleneacetic acid	15.129	3	NJ
10.	Unknown	16.345	3	J
11.	Unknown Organic Acid	16.492	3	J
12.	Unknown	19.914	10	J
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MTP

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006699.d ✓
Lab Smp Id: MB370001 ✓ Client Smp ID: 333-MW01-1 ✓
Inj Date : 25-JUL-1996 13:51
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370001 333-MW01-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m ✓
Meth Date : 05-Aug-1996 14:10 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d ✓
Als bottle: 8
Dil Factor: 1.000 ✓
Integrator: HP RTE
Target Version: 3.10
Compound Sublist: brown&root.sub ✓

Compounds	QUANT SIG	CONCENTRATIONS					
		MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN FINAL (NG) (ug/L)
=====	=====	=====	==	=====	=====	=====	=====
2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
\$ 6 2-Fluorophenol	112.00	5.471	5.471	(0.811)	173974	100	52
\$ 9 Phenol-d5	99.00	6.284	6.291	(0.932)	234002	110	56
10 Phenol	94.00	Compound Not Detected.					
12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
14 2-Chlorophenol	128.00	Compound Not Detected.					
15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
* 16 1,4-Dichlorobenzene-d4	152.00	6.746	6.753	(1.000)	41867	40	(q)
17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
30 Hexachloroethane	117.00	Compound Not Detected.					
\$ 31 Nitrobenzene-d5	82.00	7.457	7.464	(0.876)	89101	58	29
32 Nitrobenzene	77.00	Compound Not Detected.					
34 Isophorone	82.00	Compound Not Detected.					
35 2-Nitrophenol	139.00	Compound Not Detected.					
36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
* 42 Naphthalene-d8	136.00	8.512	8.519	(1.000)	153915	40	
43 Naphthalene	128.00	Compound Not Detected.					
47 Hexachlorobutadiene	225.00	Compound Not Detected.					
50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
\$ 57 2-Fluorobiphenyl	172.00	10.439	10.453	(0.875)	130917	55	28
59 2-Chloronaphthalene	162.00	Compound Not Detected.					
63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev MTP 8/6/96
MSJ/slab
000166

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN	FINAL
	MASS					(NG)	(ug/L)
=====	====	==	=====	=====	=====	=====	=====
65 2,6-Dinitrotoluene	165.00				Compound Not Detected.		
66 Acenaphthylene	152.00				Compound Not Detected.		
* 68 Acenaphthene-d10	164.00	11.934	11.941	(1.000)	84557	40	
69 Acenaphthene	154.00				Compound Not Detected.		
70 2,4-Dinitrophenol	184.00				Compound Not Detected.		
71 4-Nitrophenol	65.00				Compound Not Detected.		
74 2,4-Dinitrotoluene	165.00				Compound Not Detected.		
78 Diethylphthalate	149.00				Compound Not Detected.		
79 Fluorene	166.00				Compound Not Detected.		
80 4-Chlorophenyl-phenylether	204.00				Compound Not Detected.		
83 4,6-Dinitro-2-methylphenol	198.00				Compound Not Detected.		
84 N-Nitrosodiphenylamine (1)	169.00				Compound Not Detected.		
85 1,2-Diphenylhydrazine	77.00				Compound Not Detected.		
\$ 86 2,4,6-Tribromophenol	329.65	13.736	13.744	(1.151)	44367	110	54
89 4-Bromophenyl-phenylether	248.00				Compound Not Detected.		
90 Hexachlorobenzene	284.00				Compound Not Detected.		
92 Pentachlorophenol	266.00				Compound Not Detected.		
* 95 Phenanthrene-d10	188.00	15.334	15.348	(1.000)	121819	40	
96 Phenanthrene	178.00				Compound Not Detected.		
97 Anthracene	178.00				Compound Not Detected.		
99 Di-n-butylphthalate	149.00				Compound Not Detected.		
102 Fluoranthene	202.00				Compound Not Detected.		
103 Benzidine	184.00				Compound Not Detected.		
104 Pyrene	202.00				Compound Not Detected.		
\$ 106 Terphenyl-d14	244.00	19.195	19.203	(0.879)	138732	50	25
110 Butylbenzylphthalate	149.00				Compound Not Detected.		
112 Benzo(a)anthracene	228.00				Compound Not Detected.		
113 3,3'-Dichlorobenzidine	252.00				Compound Not Detected.		
* 114 Chrysene-d12	240.00	21.841	21.848	(1.000)	94354	40	
115 Chrysene	228.00				Compound Not Detected.		
116 bis(2-Ethylhexyl)phthalate	149.00				Compound Not Detected.		
117 Di-n-octylphthalate	149.00				Compound Not Detected.		
118 Benzo(b)fluoranthene	252.00				Compound Not Detected.		
120 Benzo(k)fluoranthene	252.00				Compound Not Detected.		
122 Benzo(a)pyrene	252.00				Compound Not Detected.		
* 123 Perylene-d12	264.00	25.314	25.329	(1.000)	91801	40	
125 Indeno(1,2,3-cd)pyrene	276.00				Compound Not Detected.		
126 Dibenz(a,h)anthracene	278.00				Compound Not Detected.		
127 Benzo(g,h,i)perylene	276.00				Compound Not Detected.		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

000167

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072596a.b/h0006699.d
Lab Smp Id: MB370001 Client Smp ID: 333-MW01-1
Inj Date : 25-JUL-1996 13:51
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370001 333-MW01-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 05-Aug-1996 10:38 mjohnson
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 8
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 16 1,4-Dichlorobenzene-d4	6.746	257147	40.000
* 42 Naphthalene-d8	8.512	361913	40.000
* 68 Acenaphthene-d10	11.934	538876	40.000
* 95 Phenanthrene-d10	15.334	369531	40.000
* 114 Chrysene-d12	21.841	367428	40.000

RT	CONCENTRATIONS				QUANT			CPND #
	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY		
=====	=====	=====	=====	=====	=====	=====	=====	
Unknown 5.713	49750	8	4	0	CAS #:	0	16	
Unknown 8.995	36324	4	2	0	CAS #:	0	42	
Unknown 9.611	53225	6	3	0	CAS #:	0	42	
Benzoic acid, ethyl- 9.955	87180	10	5	55	CAS #: 28134-31-8 NBS75K.L	9725	42	

2-butoxy ethanol 008/6/96

000180

RT	AREA	CONCENTRATIONS			QUAL	QUANT		CPND #
		ON-COL(	NG)	FINAL(ug/L)		LIBRARY	LIB ENTRY	
=====	=====	=====		=====	=====	=====	=====	=====
Unknown						CAS #:		
10.204	36576	4		2	0		0	42
Unknown						CAS #:		
12.608	54130	4		2	0		0	68
Unknown						CAS #:		
13.121	96702	7		4	0		0	68(L)
Benzene, diethenyl-						CAS #: 1321-74-0		
14.176	38058	4		2	72	NBS75K.L	65326	95
1-Naphthaleneacetic acid						CAS #: 86-87-3		
15.129	54142	6		3	95	NBS75K.L	19486	95
Unknown						CAS #:		
16.345	63180	7		3	0		0	95
Unknown Organic Acid						CAS #:		
16.492	56541	6		3	0		0	95
Unknown						CAS #:		
19.914	175750	19		10	0		0	114

QC Flag Legend

L - Operator selected an alternate library search match.

Flag Legend

L - Operator selected an alternate library search match.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW02-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006710.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/26/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop (1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy) methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000183

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW02-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006710.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/26/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CONCENTRATION UNITS:
CAS NO. COMPOUND (ug/L or ug/Kg) UG/L Q

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	50	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a) anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl) phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b) fluoranthene	10	U
207-08-9-----	Benzo(k) fluoranthene	10	U
50-32-8-----	Benzo(a) pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd) pyrene	10	U
53-70-3-----	Dibenz(a,h) anthracene	10	U
191-24-2-----	Benzo(g,h,i) perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000184

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW02-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006710.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/26/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.176	2	NJAB
2. 286-20-4	7-Oxabicyclo[4.1.0]heptane	5.396	5	NJ
3. 111-76-2	Ethanol, 2-butoxy-	5.711	3	NJB
4. 111-90-0	Ethanol, 2-(2-ethoxyethoxy) -	6.510	4	NJ
5.	Unknown	19.847	12	J
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072696a.b/h0006710.d

Lab Smp Id: MB370002

Client Smp ID: 333-MW02-1

Inj Date : 26-JUL-1996 10:56

Operator : mjohnson

Inst ID: ms3.i

Smp Info : MB370002 333-MW301-1

Misc Info :

Comment :

Method : /chem/ms3.i/h072696a.b/SV8270.m

Meth Date : 01-Aug-1996 13:06 mjohnson

Quant Type: ISTD

Cal Date : 26-JUL-1996 08:49

Cal File: h0006708.d

Als bottle: 4

Dil Factor: 1.000

Integrator: HP RTE

Compound Sublist: brown&root.sub

Target Version: 3.10

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN	FINAL
	MASS					(NG)	(ug/L)
=====	=====	==	=====	=====	=====	=====	=====
2 N-Nitrosodimethylamine	74.00				Compound Not Detected.		
\$ 6 2-Fluorophenol	112.00	5.470	5.471	(0.811)	200928	140	72
9 Phenol-d5	99.00	6.283	6.292	(0.932)	247684	140	71
10 Phenol	94.00				Compound Not Detected.		
12 bis(2-Chloroethyl)ether	63.00				Compound Not Detected.		
14 2-Chlorophenol	128.00				Compound Not Detected.		
15 1,3-Dichlorobenzene	146.00				Compound Not Detected.		
* 16 1,4-Dichlorobenzene-d4	152.00	6.745	6.746	(1.000)	36526	40	(q)
17 1,4-Dichlorobenzene	146.00				Compound Not Detected.		
20 1,2-Dichlorobenzene	146.00				Compound Not Detected.		
22 2,2'-oxybis(1-Chloropropane)	45.00				Compound Not Detected.		
26 N-Nitroso-di-n-propylamine	70.00				Compound Not Detected.		
30 Hexachloroethane	117.00				Compound Not Detected.		
\$ 31 Nitrobenzene-d5	82.00	7.455	7.457	(0.876)	103324	81	41
32 Nitrobenzene	77.00				Compound Not Detected.		
34 Isophorone	82.00				Compound Not Detected.		
35 2-Nitrophenol	139.00				Compound Not Detected.		
36 2,4-Dimethylphenol	107.00				Compound Not Detected.		
39 2,4-Dichlorophenol	162.00				Compound Not Detected.		
41 1,2,4-Trichlorobenzene	180.00				Compound Not Detected.		
* 42 Naphthalene-d8	136.00	8.511	8.512	(1.000)	126800	40	
43 Naphthalene	128.00				Compound Not Detected.		
47 Hexachlorobutadiene	225.00				Compound Not Detected.		
50 4-Chloro-3-methylphenol	107.00				Compound Not Detected.		
55 2,4,6-Trichlorophenol	196.00				Compound Not Detected.		
\$ 57 2-Fluorobiphenyl	172.00	10.445	10.447	(0.875)	160811	84	42
59 2-Chloronaphthalene	162.00				Compound Not Detected.		
63 Dimethylphthalate	163.00				Compound Not Detected.		
65 2,6-Dinitrotoluene	165.00				Compound Not Detected.		

00018 for MTD 8/6/96
Mesa/11ab

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN (NG)	FINAL (ug/L)
=====	=====	==	=====	=====	=====	=====	=====
66 Acenaphthylene	152.00				Compound Not Detected.		
* 68 Acenaphthene-d10	164.00	11.933	11.934	(1.000)	67482	40	
69 Acenaphthene	154.00				Compound Not Detected.		
70 2,4-Dinitrophenol	184.00				Compound Not Detected.		
71 4-Nitrophenol	65.00				Compound Not Detected.		
74 2,4-Dinitrotoluene	165.00				Compound Not Detected.		
78 Diethylphthalate	149.00				Compound Not Detected.		
79 Fluorene	166.00				Compound Not Detected.		
80 4-Chlorophenyl-phenylether	204.00				Compound Not Detected.		
83 4,6-Dinitro-2-methylphenol	198.00				Compound Not Detected.		
84 N-Nitrosodiphenylamine (1)	169.00				Compound Not Detected.		
85 1,2-Diphenylhydrazine	77.00				Compound Not Detected.		
\$ 86 2,4,6-Tribromophenol	329.65	13.735	13.737	(1.151)	49614	150	73
89 4-Bromophenyl-phenylether	248.00				Compound Not Detected.		
90 Hexachlorobenzene	284.00				Compound Not Detected.		
92 Pentachlorophenol	266.00				Compound Not Detected.		
* 95 Phenanthrene-d10	188.00	15.333	15.342	(1.000)	96707	40	
96 Phenanthrene	178.00				Compound Not Detected.		
97 Anthracene	178.00				Compound Not Detected.		
99 Di-n-butylphthalate	149.00				Compound Not Detected.		
102 Fluoranthene	202.00				Compound Not Detected.		
103 Benzidine	184.00				Compound Not Detected.		
104 Pyrene	202.00				Compound Not Detected.		
\$ 106 Terphenyl-d14	244.00	19.194	19.196	(0.879)	166512	74	37
110 Butylbenzylphthalate	149.00				Compound Not Detected.		
112 Benzo(a)anthracene	228.00				Compound Not Detected.		
113 3,3'-Dichlorobenzidine	252.00				Compound Not Detected.		
* 114 Chrysene-d12	240.00	21.832	21.841	(1.000)	79701	40	
115 Chrysene	228.00				Compound Not Detected.		
116 bis(2-Ethylhexyl)phthalate	149.00				Compound Not Detected.		
117 Di-n-octylphthalate	149.00				Compound Not Detected.		
118 Benzo(b)fluoranthene	252.00				Compound Not Detected.		
120 Benzo(k)fluoranthene	252.00				Compound Not Detected.		
122 Benzo(a)pyrene	252.00				Compound Not Detected.		
* 123 Perylene-d12	264.00	25.313	25.322	(1.000)	78846	40	
125 Indeno(1,2,3-cd)pyrene	276.00				Compound Not Detected.		
126 Dibenz(a,h)anthracene	278.00				Compound Not Detected.		
127 Benzo(g,h,i)perylene	276.00				Compound Not Detected.		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072696a.b/h0006710.d
Lab Smp Id: MB370002 Client Smp ID: 333-MW02-1
Inj Date : 26-JUL-1996 10:56
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370002 333-MW301-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072696a.b/SV8270.m
Meth Date : 01-Aug-1996 13:06 mjohnson
Cal Date : 26-JUL-1996 08:49 Cal File: h0006708.d
Als bottle: 4
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 16 1,4-Dichlorobenzene-d4	6.745	233683	40.000
* 114 Chrysene-d12	21.832	320869	40.000

CONCENTRATIONS					QUANT			
RT	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #	
=====	=====	=====	=====	=====	=====	=====	=====	
2-Pentanone, 4-hydroxy-4-methyl-					CAS #: 123-42-2			
5.176	23783	4	2	50	NBS75K.L	64275	16	
Unknown					CAS #: 286-20-4			
5.396	61446	10	5	0		0	16	
Unknown Alcohol					CAS #: 111-76-2			
5.711	31345	5	3	0		0	16	
Unknown Alcohol					CAS #: 111-90-0			
6.510	44203	8	4	0		0	16	
Unknown					CAS #:			
19.847	195935	24	12	0		0	114	

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370003

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006701.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-oxybis(1-Chloroprop (1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy) methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000194

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370003

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006701.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	50	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000194A

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370003

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006701.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.179	3	NJAB
2. 286-20-4	7-Oxabicyclo[4.1.0]heptane	5.398	3	NJ
3. 111-76-2	Ethanol, 2-butoxy-	5.721	4	NJB
4.	Unknown	6.512	5	J
5.	Unknown	6.600	2	J
6.	Unknown	19.849	11	J
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
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24.				
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26.				
27.				
28.				
29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006701.d ✓
Lab Smp Id: MB370003 Client Smp ID: 333-MW03-1 ✓
Inj Date : 25-JUL-1996 15:10
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370003 333-MW03-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m ✓
Meth Date : 05-Aug-1996 14:10 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d ✓
Als bottle: 10
Dil Factor: 1.000 ✓
Integrator: HP RTE
Target Version: 3.10
Compound Sublist: brown&root.sub

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN	FINAL
	MASS					(NG)	(ug/L)
=====	====	==	=====	=====	=====	=====	=====
2 N-Nitrosodimethylamine	74.00				Compound Not Detected.		
\$ 6 2-Fluorophenol	112.00	5.472	5.471	(0.811)	223654	160	81
\$ 9 Phenol-d5	99.00	6.292	6.291	(0.933)	266947	160	78
10 Phenol	94.00				Compound Not Detected.		
12 bis(2-Chloroethyl)ether	63.00				Compound Not Detected.		
14 2-Chlorophenol	128.00				Compound Not Detected.		
15 1,3-Dichlorobenzene	146.00				Compound Not Detected.		
* 16 1,4-Dichlorobenzene-d4	152.00	6.747	6.753	(1.000)	34597	40	(Q)
17 1,4-Dichlorobenzene	146.00				Compound Not Detected.		
20 1,2-Dichlorobenzene	146.00				Compound Not Detected.		
22 2,2'-oxybis(1-Chloropropane)	45.00				Compound Not Detected.		
26 N-Nitroso-di-n-propylamine	70.00				Compound Not Detected.		
30 Hexachloroethane	117.00				Compound Not Detected.		
\$ 31 Nitrobenzene-d5	82.00	7.465	7.464	(0.877)	103013	81	40
32 Nitrobenzene	77.00				Compound Not Detected.		
34 Isophorone	82.00				Compound Not Detected.		
35 2-Nitrophenol	139.00				Compound Not Detected.		
36 2,4-Dimethylphenol	107.00				Compound Not Detected.		
38 bis(2-Chloroethoxy)methane	93.00				Compound Not Detected.		
39 2,4-Dichlorophenol	162.00				Compound Not Detected.		
41 1,2,4-Trichlorobenzene	180.00				Compound Not Detected.		
* 42 Naphthalene-d8	136.00	8.513	8.519	(1.000)	127803	40	
43 Naphthalene	128.00				Compound Not Detected.		
47 Hexachlorobutadiene	225.00				Compound Not Detected.		
50 4-Chloro-3-methylphenol	107.00				Compound Not Detected.		
55 2,4,6-Trichlorophenol	196.00				Compound Not Detected.		
\$ 57 2-Fluorobiphenyl	172.00	10.447	10.453	(0.875)	161158	78	39
59 2-Chloronaphthalene	162.00				Compound Not Detected.		
63 Dimethylphthalate	163.00				Compound Not Detected.		

Rw MTP 8/6/96
M305/ab
000197

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN (NG)	FINAL (ug/L)
=====	=====	==	=====	=====	=====	=====	=====
65 2,6-Dinitrotoluene	165.00				Compound Not Detected.		
66 Acenaphthylene	152.00				Compound Not Detected.		
* 68 Acenaphthene-d10	164.00	11.942	11.941	(1.000)	73489	40	
69 Acenaphthene	154.00				Compound Not Detected.		
70 2,4-Dinitrophenol	184.00				Compound Not Detected.		
71 4-Nitrophenol	65.00				Compound Not Detected.		
74 2,4-Dinitrotoluene	165.00				Compound Not Detected.		
78 Diethylphthalate	149.00				Compound Not Detected.		
79 Fluorene	166.00				Compound Not Detected.		
80 4-Chlorophenyl-phenylether	204.00				Compound Not Detected.		
83 4,6-Dinitro-2-methylphenol	198.00				Compound Not Detected.		
84 N-Nitrosodiphenylamine (1)	169.00				Compound Not Detected.		
85 1,2-Diphenylhydrazine	77.00				Compound Not Detected.		
\$ 86 2,4,6-Tribromophenol	329.65	13.737	13.744	(1.150)	53473	150	75
89 4-Bromophenyl-phenylether	248.00				Compound Not Detected.		
90 Hexachlorobenzene	284.00				Compound Not Detected.		
92 Pentachlorophenol	266.00				Compound Not Detected.		
* 95 Phenanthrene-d10	188.00	15.342	15.348	(1.000)	106536	40	
96 Phenanthrene	178.00				Compound Not Detected.		
97 Anthracene	178.00				Compound Not Detected.		
99 Di-n-butylphthalate	149.00				Compound Not Detected.		
102 Fluoranthene	202.00				Compound Not Detected.		
103 Benzidine	184.00				Compound Not Detected.		
104 Pyrene	202.00				Compound Not Detected.		
\$ 106 Terphenyl-d14	244.00	19.204	19.203	(0.879)	191608	83	42
110 Butylbenzylphthalate	149.00				Compound Not Detected.		
112 Benzo(a)anthracene	228.00				Compound Not Detected.		
113 3,3'-Dichlorobenzidine	252.00				Compound Not Detected.		
* 114 Chrysene-d12	240.00	21.842	21.848	(1.000)	78248	40	
115 Chrysene	228.00				Compound Not Detected.		
116 bis(2-Ethylhexyl)phthalate	149.00				Compound Not Detected.		
117 Di-n-octylphthalate	149.00				Compound Not Detected.		
118 Benzo(b)fluoranthene	252.00				Compound Not Detected.		
120 Benzo(k)fluoranthene	252.00				Compound Not Detected.		
122 Benzo(a)pyrene	252.00				Compound Not Detected.		
* 123 Perylene-d12	264.00	25.322	25.329	(1.000)	67484	40	
125 Indeno(1,2,3-cd)pyrene	276.00				Compound Not Detected.		
126 Dibenzo(a,h)anthracene	278.00				Compound Not Detected.		
127 Benzo(g,h,i)perylene	276.00				Compound Not Detected.		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072596a.b/h0006701.d
 Lab Smp Id: MB370003 Client Smp ID: 333-MW03-1
 Inj Date : 25-JUL-1996 15:10
 Operator : mjohnson Inst ID: ms3.i
 Smp Info : MB370003 333-MW03-1
 Misc Info :
 Comment :
 Method : /chem/ms3.i/h072596a.b/SV8270.m
 Meth Date : 31-Jul-1996 16:11 mjohnson
 Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
 Als bottle: 10
 Dil Factor: 1.000 Target Version: 3.10
 Integrator: HP RTE Compound Sublist: brown&root.sub
 Sample Matrix: WATER
 Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 16 1,4-Dichlorobenzene-d4	6.747	222144	40.000
* 114 Chrysene-d12	21.842	323072	40.000

CONCENTRATIONS					QUANT		
RT	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
=====	=====	=====	=====	=====	=====	=====	=====
2-Pentanone, 4-hydroxy-4-methyl-					CAS #: 123-42-2		
5.179	35560	6	3	56	NBS75K.L	64275	16
Unknown					CAS #: 286-20-4		
5.398	33343	6	3	0		0	16
Unknown Alcohol					CAS #: 111-76-2		
5.721	45884	8	4	0		0	16
Unknown Alcohol					CAS #:		
6.512	53627	10	5	0		0	16
Unknown Alcohol					CAS #:		
6.600	22722	4	2	0		0	16
Unknown					CAS #:		
19.849	175054	22	11	0		0	114

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-PC4-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370004

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006702.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

62-75-9-----	N-Nitrosodimethylamine	10	U
108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
108-60-1-----	2,2'-oxybis(1-Chloroprop (1)	10	U
621-64-7-----	N-Nitroso-di-n-propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
111-91-1-----	bis(2-Chloroethoxy) methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-methylphenol	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
91-58-7-----	2-Chloronaphthalene	10	U
131-11-3-----	Dimethylphthalate	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U
208-96-8-----	Acenaphthylene	10	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
86-73-7-----	Fluorene	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846 *mmf*

000206

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-PC4-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370004

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006702.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	50	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000207

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-PC4-1

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370004

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006702.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

Number TICs found: 13

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.179	5	NJAB
2. 286-20-4	7-Oxabicyclo[4.1.0]heptane	5.406	7	NJ
3. 822-67-3	2-Cyclohexen-1-ol	5.626	2	NJ
4. 111-76-2	Ethanol, 2-butoxy-	5.721	4	NJB
5. 930-68-7	2-Cyclohexen-1-one	6.044	2	NJ
6. 111-90-0	Ethanol, 2-(2-ethoxyethoxy)-	6.513	4	NJ
7. 13429-07-7	2-Propanol, 1-(2-methoxyprop	6.600	2	NJ
8. 2039-89-6	Benzene, 2-ethenyl-1,4-dimet	8.110	2	NJ
9. 544-63-8	Tetradecanoic acid	14.426	4	NJ
10.	Unknown Hydrocarbon	16.339	16	J
11.	Unknown Hydrocarbon	16.405	7	J
12. 57-10-3	Hexadecanoic acid	16.493	4	NJ
13.	Unknown	19.864	14	J
14.				
15.				
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24.				
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26.				
27.				
28.				
29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006702.d ✓
Lab Smp Id: MB370004 ✓ Client Smp ID: 333-PC4-1 ✓
Inj Date : 25-JUL-1996 15:50
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370004 333-PC4-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m ✓
Meth Date : 05-Aug-1996 14:10 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d ✓
Als bottle: 11
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: brown&root.sub ✓
Target Version: 3.10

Compounds	QUANT SIG						CONCENTRATIONS	
		MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN (NG)	FINAL (ug/L)
=====	=====	=====	==	=====	=====	=====	=====	=====
2 N-Nitrosodimethylamine	74.00					Compound Not Detected.		
\$ 6 2-Fluorophenol	112.00		5.472	5.471	(0.811)	240168	180	91
\$ 9 Phenol-d5	99.00		6.293	6.291	(0.933)	298463	180	90
10 Phenol	94.00					Compound Not Detected.		
12 bis(2-Chloroethyl)ether	63.00					Compound Not Detected.		
14 2-Chlorophenol	128.00					Compound Not Detected.		
15 1,3-Dichlorobenzene	146.00					Compound Not Detected.		
* 16 1,4-Dichlorobenzene-d4	152.00		6.747	6.753	(1.000)	33303	40	(Q)
17 1,4-Dichlorobenzene	146.00					Compound Not Detected.		
20 1,2-Dichlorobenzene	146.00					Compound Not Detected.		
22 2,2'-oxybis(1-Chloropropane)	45.00					Compound Not Detected.		
26 N-Nitroso-di-n-propylamine	70.00					Compound Not Detected.		
30 Hexachloroethane	117.00					Compound Not Detected.		
\$ 31 Nitrobenzene-d5	82.00		7.465	7.464	(0.877)	119064	93	46
32 Nitrobenzene	77.00					Compound Not Detected.		
34 Isophorone	82.00					Compound Not Detected.		
35 2-Nitrophenol	139.00					Compound Not Detected.		
36 2,4-Dimethylphenol	107.00					Compound Not Detected.		
38 bis(2-Chloroethoxy)methane	93.00					Compound Not Detected.		
39 2,4-Dichlorophenol	162.00					Compound Not Detected.		
41 1,2,4-Trichlorobenzene	180.00					Compound Not Detected.		
* 42 Naphthalene-d8	136.00		8.513	8.519	(1.000)	129434	40	
43 Naphthalene	128.00					Compound Not Detected.		
47 Hexachlorobutadiene	225.00					Compound Not Detected.		
50 4-Chloro-3-methylphenol	107.00					Compound Not Detected.		
55 2,4,6-Trichlorophenol	196.00					Compound Not Detected.		
\$ 57 2-Fluorobiphenyl	172.00		10.448	10.453	(0.875)	181745	86	43
59 2-Chloronaphthalene	162.00					Compound Not Detected.		
63 Dimethylphthalate	163.00					Compound Not Detected.		

Rev MTP 8/6/96
NET 8/5/96
000210

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN	FINAL
	MASS					(NG)	(ug/L)
=====	=====	==	=====	=====	=====	=====	=====
65 2,6-Dinitrotoluene	165.00				Compound Not Detected.		
66 Acenaphthylene	152.00				Compound Not Detected.		
* 68 Acenaphthene-d10	164.00	11.942	11.941	(1.000)	75498	40	
69 Acenaphthene	154.00				Compound Not Detected.		
70 2,4-Dinitrophenol	184.00				Compound Not Detected.		
71 4-Nitrophenol	65.00				Compound Not Detected.		
74 2,4-Dinitrotoluene	165.00				Compound Not Detected.		
78 Diethylphthalate	149.00				Compound Not Detected.		
79 Fluorene	166.00				Compound Not Detected.		
80 4-Chlorophenyl-phenylether	204.00				Compound Not Detected.		
83 4,6-Dinitro-2-methylphenol	198.00				Compound Not Detected.		
84 N-Nitrosodiphenylamine (1)	169.00				Compound Not Detected.		
85 1,2-Diphenylhydrazine	77.00				Compound Not Detected.		
\$ 86 2,4,6-Tribromophenol	329.65	13.745	13.744	(1.151)	58257	160	79
89 4-Bromophenyl-phenylether	248.00				Compound Not Detected.		
90 Hexachlorobenzene	284.00				Compound Not Detected.		
92 Pentachlorophenol	266.00				Compound Not Detected.		
* 95 Phenanthrene-d10	188.00	15.342	15.348	(1.000)	107731	40	
96 Phenanthrene	178.00				Compound Not Detected.		
97 Anthracene	178.00				Compound Not Detected.		
99 Di-n-butylphthalate	149.00				Compound Not Detected.		
102 Fluoranthene	202.00				Compound Not Detected.		
103 Benzidine	184.00				Compound Not Detected.		
104 Pyrene	202.00				Compound Not Detected.		
\$ 106 Terphenyl-d14	244.00	19.204	19.203	(0.879)	188790	80	40
110 Butylbenzylphthalate	149.00				Compound Not Detected.		
112 Benzo(a)anthracene	228.00				Compound Not Detected.		
113 3,3'-Dichlorobenzidine	252.00				Compound Not Detected.		
* 114 Chrysene-d12	240.00	21.842	21.848	(1.000)	79930	40	
115 Chrysene	228.00				Compound Not Detected.		
116 bis(2-Ethylhexyl)phthalate	149.00				Compound Not Detected.		
117 Di-n-octylphthalate	149.00				Compound Not Detected.		
118 Benzo(b)fluoranthene	252.00				Compound Not Detected.		
120 Benzo(k)fluoranthene	252.00				Compound Not Detected.		
122 Benzo(a)pyrene	252.00				Compound Not Detected.		
* 123 Perylene-d12	264.00	25.323	25.329	(1.000)	71160	40	
125 Indeno(1,2,3-cd)pyrene	276.00				Compound Not Detected.		
126 Dibenz(a,h)anthracene	278.00				Compound Not Detected.		
127 Benzo(g,h,i)perylene	276.00				Compound Not Detected.		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072596a.b/h0006702.d
Lab Smp Id: MB370004 Client Smp ID: 333-PC4-1
Inj Date : 25-JUL-1996 15:50
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370004 333-PC4-1
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 31-Jul-1996 16:11 mjohnson
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 11
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 16 1,4-Dichlorobenzene-d4	6.747	214519	40.000
* 42 Naphthalene-d8	8.513	320357	40.000
* 95 Phenanthrene-d10	15.342	343588	40.000
* 114 Chrysene-d12	21.842	308127	40.000

CONCENTRATIONS

QUANT

RT	AREA	ON-COL(	NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
=====	=====	=====	=====	=====	=====	=====	=====	=====
✓ 2-Pentanone, 4-hydroxy-4-methyl-						CAS #: 123-42-2		
5.179	55946	10		5	64	NBS75K.1	64275	16
Unknown						CAS #: 286-20-4		
5.406	74977	14		7	0		0	16
2-Cyclohexen-1-ol						CAS #: 822-67-3		
5.626	24130	4		2	64	NBS75K.1	63202	16
Unknown Alcohol						CAS #: 111-76-2		
5.721	48563	9		4	0		0	16

RT	AREA	CONCENTRATIONS			QUAL	QUANT		CPND #
		ON-COL(	NG)	FINAL(ug/L)		LIBRARY	LIB ENTRY	
====	====	=====		=====	====	=====	=====	=====
2-Cyclohexen-1-one						CAS #: 930-68-7		
6.044	22685	4		2	90	NBS75K.L	1088	16
Unknown Alcohol						CAS #: 111-40-0		
6.513	40035	7		4	0		0	16
Unknown Alcohol						CAS #: 13429-07-7		
6.600	22753	4		2	0		0	16
Benzene, 2-ethenyl-1,4-dimethyl-						CAS #: 2039-89-6		
8.110	34337	4		2	96	NBS75K.L	5879	42
Tetradecanoic acid						CAS #: 544-63-8		
14.426	61359	7		4	97	NBS75K.L	70843	95
Unknown hydrocarbon						CAS #:		
16.339	281417	33		16	0		0	95
Unknown hydrocarbon						CAS #:		
16.405	120641	14		7	0		0	95
Hexadecanoic acid						CAS #: 57-10-3		
16.493	61138	7		4	97	NBS75K.L	71609	95
Unknown						CAS #:		
19.864	210340	27		14	0		0	114

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1B

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370005

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006690.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/24/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

62-75-9-----	N-Nitrosodimethylamine	10	U
108-95-2-----	Phenol	10	U
111-44-4-----	bis(2-Chloroethyl) ether	10	U
95-57-8-----	2-Chlorophenol	10	U
541-73-1-----	1,3-Dichlorobenzene	10	U
106-46-7-----	1,4-Dichlorobenzene	10	U
95-50-1-----	1,2-Dichlorobenzene	10	U
108-60-1-----	2,2'-oxybis(1-Chloroprop (1)	10	U
621-64-7-----	N-Nitroso-di-n-propylamine	10	U
67-72-1-----	Hexachloroethane	10	U
98-95-3-----	Nitrobenzene	10	U
78-59-1-----	Isophorone	10	U
88-75-5-----	2-Nitrophenol	10	U
105-67-9-----	2,4-Dimethylphenol	10	U
111-91-1-----	bis(2-Chloroethoxy) methane	10	U
120-83-2-----	2,4-Dichlorophenol	10	U
120-82-1-----	1,2,4-Trichlorobenzene	10	U
91-20-3-----	Naphthalene	10	U
87-68-3-----	Hexachlorobutadiene	10	U
59-50-7-----	4-Chloro-3-methylphenol	10	U
88-06-2-----	2,4,6-Trichlorophenol	10	U
91-58-7-----	2-Chloronaphthalene	10	U
131-11-3-----	Dimethylphthalate	10	U
606-20-2-----	2,6-Dinitrotoluene	10	U
208-96-8-----	Acenaphthylene	10	U
83-32-9-----	Acenaphthene	10	U
51-28-5-----	2,4-Dinitrophenol	50	U
100-02-7-----	4-Nitrophenol	50	U
121-14-2-----	2,4-Dinitrotoluene	10	U
84-66-2-----	Diethylphthalate	10	U
86-73-7-----	Fluorene	10	U
7005-72-3-----	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000227

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1B

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370005

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006690.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/24/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine __ (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	50	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo (a) anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo (b) fluoranthene	10	U
207-08-9-----	Benzo (k) fluoranthene	10	U
50-32-8-----	Benzo (a) pyrene	10	U
193-39-5-----	Indeno (1,2,3-cd) pyrene	10	U
53-70-3-----	Dibenz (a,h) anthracene	10	U
191-24-2-----	Benzo (g,h,i) perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000228

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW01-1B

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370005

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006690.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/24/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 1.0

Number TICs found: 11

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown	5.277	3	J
2.	Unknown	5.439	2	J
3.	Unknown	5.483	3	J
4.	Unknown	5.798	6	J
5.	Unknown	6.596	4	J
6. 90-05-1	Phenol, 2-methoxy-	7.512	4	NJ
7. 65-85-0	Benzoic Acid	8.033	3	NJ
8. 13679-75-9	1-(2-Thienyl)-1-propanone	8.524	3	NJ
9. 121-33-5	Vanillin	10.898	6	NJ
10.	Unknown	12.649	3	J
11.	Unknown	16.555	4	J
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072496a.b/h0006690.d ✓
Lab Smp Id: MB370005 ✓ Client Smp ID: 333-MW01-1B
Inj Date : 24-JUL-1996 19:59
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370005 333-MW01-1B
Misc Info :
Comment :
Method : /chem/ms3.i/h072496a.b/SV8270.m ✓
Meth Date : 31-Jul-1996 14:13 mjohnson Quant Type: ISTD
Cal Date : 24-JUL-1996 08:55 Cal File: h0006673.d ✓
Als bottle: 19
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: brown&root.sub ✓
Target Version: 3.10

Compounds	QUANT SIG	CONCENTRATIONS					
		MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN FINAL (NG) (ug/L)
=====	=====	=====	==	=====	=====	=====	=====
2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
\$ 6 2-Fluorophenol	112.00	5.549	5.550	(0.811)	248489	150	77
9 Phenol-d5	99.00	6.377	6.378	(0.931)	299882	140	73
10 Phenol	94.00	Compound Not Detected.					
12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
14 2-Chlorophenol	128.00	Compound Not Detected.					
15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
* 16 1,4-Dichlorobenzene-d4	152.00	6.846	6.839	(1.000)	41903	40	(0)
17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
30 Hexachloroethane	117.00	Compound Not Detected.					
\$ 31 Nitrobenzene-d5	82.00	7.564	7.565	(0.876)	121605	87	44
32 Nitrobenzene	77.00	Compound Not Detected.					
34 Isophorone	82.00	Compound Not Detected.					
35 2-Nitrophenol	139.00	Compound Not Detected.					
36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
* 42 Naphthalene-d8	136.00	8.634	8.635	(1.000)	153885	40	
43 Naphthalene	128.00	Compound Not Detected.					
47 Hexachlorobutadiene	225.00	Compound Not Detected.					
50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
\$ 57 2-Fluorobiphenyl	172.00	10.583	10.576	(0.876)	202210	94	47
59 2-Chloronaphthalene	162.00	Compound Not Detected.					
63 Dimethylphthalate	163.00	Compound Not Detected.					
65 2,6-Dinitrotoluene	165.00	Compound Not Detected.					

Rev mmp 8/16/96
000231

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN (NG)	FINAL (ug/L)
=====	=====	==	=====	=====	=====	=====	=====
66 Acenaphthylene	152.00				Compound Not Detected.		
* 68 Acenaphthene-d10	164.00	12.078	12.079	(1.000)	85491	40	
69 Acenaphthene	154.00				Compound Not Detected.		
70 2,4-Dinitrophenol	184.00				Compound Not Detected.		
71 4-Nitrophenol	65.00				Compound Not Detected.		
74 2,4-Dinitrotoluene	165.00				Compound Not Detected.		
78 Diethylphthalate	149.00				Compound Not Detected.		
79 Fluorene	166.00				Compound Not Detected.		
80 4-Chlorophenyl-phenylether	204.00				Compound Not Detected.		
83 4,6-Dinitro-2-methylphenol	198.00				Compound Not Detected.		
84 N-Nitrosodiphenylamine (1)	169.00				Compound Not Detected.		
85 1,2-Diphenylhydrazine	77.00				Compound Not Detected.		
\$ 86 2,4,6-Tribromophenol	329.65	13.888	13.889	(1.150)	61348	140	72
89 4-Bromophenyl-phenylether	248.00				Compound Not Detected.		
90 Hexachlorobenzene	284.00				Compound Not Detected.		
92 Pentachlorophenol	266.00				Compound Not Detected.		
* 95 Phenanthrene-d10	188.00	15.492	15.501	(1.000)	124343	40	
96 Phenanthrene	178.00				Compound Not Detected.		
97 Anthracene	178.00				Compound Not Detected.		
99 Di-n-butylphthalate	149.00				Compound Not Detected.		
102 Fluoranthene	202.00				Compound Not Detected.		
103 Benzidine	184.00				Compound Not Detected.		
104 Pyrene	202.00				Compound Not Detected.		
106 Terphenyl-d14	244.00	19.354	19.348	(0.880)	234555	74	37
110 Butylbenzylphthalate	149.00				Compound Not Detected.		
112 Benzo(a)anthracene	228.00				Compound Not Detected.		
113 3,3'-Dichlorobenzidine	252.00				Compound Not Detected.		
* 114 Chrysene-d12	240.00	21.999	22.008	(1.000)	99086	40	
115 Chrysene	228.00				Compound Not Detected.		
116 bis(2-Ethylhexyl)phthalate	149.00				Compound Not Detected.		
117 Di-n-octylphthalate	149.00				Compound Not Detected.		
118 Benzo(b)fluoranthene	252.00				Compound Not Detected.		
120 Benzo(k)fluoranthene	252.00				Compound Not Detected.		
122 Benzo(a)pyrene	252.00				Compound Not Detected.		
* 123 Perylene-d12	264.00	25.509	25.510	(1.000)	96455	40	
125 Indeno(1,2,3-cd)pyrene	276.00				Compound Not Detected.		
126 Dibenz(a,h)anthracene	278.00				Compound Not Detected.		
127 Benzo(g,h,i)perylene	276.00				Compound Not Detected.		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

CH2M Hill Montgomery

Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072496a.b/h0006690.d
Lab Smp Id: MB370005 Client Smp ID: 333-MW01-1B
Inj Date : 24-JUL-1996 19:59
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370005 333-MW01-1B
Misc Info :
Comment :
Method : /chem/ms3.i/h072496a.b/SV8270.m
Meth Date : 31-Jul-1996 14:13 mjohnson
Cal Date : 24-JUL-1996 08:55 Cal File: h0006673.d
Als bottle: 19
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 16 1,4-Dichlorobenzene-d4	6.846	298247	40.000
* 42 Naphthalene-d8	8.634	355512	40.000
68 Acenaphthene-d10	12.078	385706	40.000
* 95 Phenanthrene-d10	15.492	367883	40.000

RT	CONCENTRATIONS			QUAL	QUANT		
	AREA	ON-COL(NG)	FINAL(ug/L)		LIBRARY	LIB ENTRY	CPND #
=====	=====	=====	=====	=====	=====	=====	=====
Unknown Alcohol <i>2/26/96</i>				CAS #:			
5.277	43475	6	3	0		0	16
Unknown				CAS #:			
5.439	34534	5	2	0		0	16
Unknown				CAS #:			
5.483	40618	5	3	0		0	16
Unknown Alcohol <i>2/26/96</i>				CAS #:			
5.798	89837	12	6	0		0	16

000244

RT	AREA	CONCENTRATIONS			QUAL	QUANT		CPND #
		ON-COL(	NG)	FINAL(ug/L)		LIBRARY	LIB ENTRY	
====	====	=====		=====	=====	=====	=====	=====
Unknown-Alcohol								
6.596	56962	8		4	0		0	16
CAS #:								
Phenol, 2-methoxy-								
7.512	60419	8		4	91	NBS75K.l	64772	16
CAS #: 90-05-1								
Benzoic Acid								
8.033	51612	6		3	97	NBS75K.l	3903	42
CAS #: 65-85-0								
1-(2-Thienyl)-1-propanone								
8.524	54316	6		3	83	NBS75K.l	7304	42
CAS #: 13679-75-9								
Vanillin								
10.898	111390	12		6	98	NBS75K.l	66916	68
CAS #: 121-33-5								
Unknown								
12.649	64701	7		3	0		0	68
CAS #:								
Unknown								
16.555	74634	8		4	0		0	95
CAS #:								

000245

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1D

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370006

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006703.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

62-75-9-----N-Nitrosodimethylamine_____	10	U
108-95-2-----Phenol_____	10	U
111-44-4-----bis(2-Chloroethyl) ether_____	10	U
95-57-8-----2-Chlorophenol_____	10	U
541-73-1-----1,3-Dichlorobenzene_____	10	U
106-46-7-----1,4-Dichlorobenzene_____	10	U
95-50-1-----1,2-Dichlorobenzene_____	10	U
108-60-1-----2,2'-oxybis(1-Chloroprop_(1)_____	10	U
621-64-7-----N-Nitroso-di-n-propylamine_____	10	U
67-72-1-----Hexachloroethane_____	10	U
98-95-3-----Nitrobenzene_____	10	U
78-59-1-----Isophorone_____	10	U
88-75-5-----2-Nitrophenol_____	10	U
105-67-9-----2,4-Dimethylphenol_____	10	U
111-91-1-----bis(2-Chloroethoxy) methane_____	10	U
120-83-2-----2,4-Dichlorophenol_____	10	U
120-82-1-----1,2,4-Trichlorobenzene_____	10	U
91-20-3-----Naphthalene_____	10	U
87-68-3-----Hexachlorobutadiene_____	10	U
59-50-7-----4-Chloro-3-methylphenol_____	10	U
88-06-2-----2,4,6-Trichlorophenol_____	10	U
91-58-7-----2-Chloronaphthalene_____	10	U
131-11-3-----Dimethylphthalate_____	10	U
606-20-2-----2,6-Dinitrotoluene_____	10	U
208-96-8-----Acenaphthylene_____	10	U
83-32-9-----Acenaphthene_____	10	U
51-28-5-----2,4-Dinitrophenol_____	50	U
100-02-7-----4-Nitrophenol_____	50	U
121-14-2-----2,4-Dinitrotoluene_____	10	U
84-66-2-----Diethylphthalate_____	10	U
86-73-7-----Fluorene_____	10	U
7005-72-3-----4-Chlorophenyl-phenylether_____	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000246

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1D

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370006

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006703.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	10	U
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	50	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a) anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	10	U
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b) fluoranthene	10	U
207-08-9-----	Benzo(k) fluoranthene	10	U
50-32-8-----	Benzo(a) pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd) pyrene	10	U
53-70-3-----	Dibenz(a,h) anthracene	10	U
191-24-2-----	Benzo(g,h,i) perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000247

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

333-MW03-1D

Lab Name: CH2M HILL

Contract: MB370

Lab Code: MGM

Case No.: MB370

SAS No.:

SDG No.: MB370

Matrix: (soil/water) WATER

Lab Sample ID: MB370006

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: H0006703.D

Level: (low/med) LOW

Date Received: 07/13/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 07/16/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 07/25/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

Number TICs found: 7

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 123-42-2	2-Pentanone, 4-hydroxy-4-met	5.182	4	NJAB
2. 111-76-2	Ethanol, 2-butoxy-	5.717	5	NJB
3. 111-90-0	Ethanol, 2-(2-ethoxyethoxy)-	6.516	6	NJ
4. 13429-07-7	2-Propanol, 1-(2-methoxyprop	6.597	3	NJ
5.	Unknown Hydrocarbon	16.320	3	J
6.	Unknown Hydrocarbon	16.401	3	J
7.	Unknown	19.852	14	J
8.				
9.				
10.				
11.				
12.				
13.				
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29.				
30.				

CH2M Hill Montgomery

SW846 SEMI-VOLATILES

Data file : /chem/ms3.i/h072596a.b/h0006703.d ✓
Lab Smp Id: MB370006 ✓ Client Smp ID: 333-MW03-1D ✓
Inj Date : 25-JUL-1996 16:30
Operator : mjohnson Inst ID: ms3.i.
Smp Info : MB370006 333-MW03-1D ✓
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m ✓
Meth Date : 05-Aug-1996 14:10 mjohnson Quant Type: ISTD
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d ✓
Als bottle: 12
Dil Factor: 1.000 ✓
Integrator: HP RTE Compound Sublist: brown&root.sub ✓
Target Version: 3.10

Compounds	QUANT SIG	CONCENTRATIONS					
		MASS	RT	EXP RT	REL RT	RESPONSE	ON-COLUMN FINAL (NG) (ug/L)
=====	=====	=====	==	=====	=====	=====	=====
2 N-Nitrosodimethylamine	74.00	Compound Not Detected.					
\$ 6 2-Fluorophenol	112.00	5.468	5.471	(0.810)	264332	160	82
\$ 9 Phenol-d5	99.00	6.289	6.291	(0.932)	315334	160	78
10 Phenol	94.00	Compound Not Detected.					
12 bis(2-Chloroethyl)ether	63.00	Compound Not Detected.					
14 2-Chlorophenol	128.00	Compound Not Detected.					
15 1,3-Dichlorobenzene	146.00	Compound Not Detected.					
* 16 1,4-Dichlorobenzene-d4	152.00	6.750	6.753	(1.000)	40637	40	(Q)
17 1,4-Dichlorobenzene	146.00	Compound Not Detected.					
20 1,2-Dichlorobenzene	146.00	Compound Not Detected.					
22 2,2'-oxybis(1-Chloropropane)	45.00	Compound Not Detected.					
26 N-Nitroso-di-n-propylamine	70.00	Compound Not Detected.					
30 Hexachloroethane	117.00	Compound Not Detected.					
\$ 31 Nitrobenzene-d5	82.00	7.461	7.464	(0.876)	128547	88	44
32 Nitrobenzene	77.00	Compound Not Detected.					
34 Isophorone	82.00	Compound Not Detected.					
35 2-Nitrophenol	139.00	Compound Not Detected.					
36 2,4-Dimethylphenol	107.00	Compound Not Detected.					
38 bis(2-Chloroethoxy)methane	93.00	Compound Not Detected.					
39 2,4-Dichlorophenol	162.00	Compound Not Detected.					
41 1,2,4-Trichlorobenzene	180.00	Compound Not Detected.					
* 42 Naphthalene-d8	136.00	8.516	8.519	(1.000)	147862	40	
43 Naphthalene	128.00	Compound Not Detected.					
47 Hexachlorobutadiene	225.00	Compound Not Detected.					
50 4-Chloro-3-methylphenol	107.00	Compound Not Detected.					
55 2,4,6-Trichlorophenol	196.00	Compound Not Detected.					
\$ 57 2-Fluorobiphenyl	172.00	10.451	10.453	(0.875)	197936	88	44
59 2-Chloronaphthalene	162.00	Compound Not Detected.					
63 Dimethylphthalate	163.00	Compound Not Detected.					

Rev MTP 8/6/96
08/10/5/96
000250

Compounds	QUANT SIG	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS	
						ON-COLUMN (NG)	FINAL (ug/L)
=====	=====	==	=====	=====	=====	=====	=====
65 2,6-Dinitrotoluene	165.00				Compound Not Detected.		
66 Acenaphthylene	152.00				Compound Not Detected.		
* 68 Acenaphthene-d10	164.00	11.938	11.941	(1.000)	80316	40	
69 Acenaphthene	154.00				Compound Not Detected.		
70 2,4-Dinitrophenol	184.00				Compound Not Detected.		
71 4-Nitrophenol	65.00				Compound Not Detected.		
74 2,4-Dinitrotoluene	165.00				Compound Not Detected.		
78 Diethylphthalate	149.00				Compound Not Detected.		
79 Fluorene	166.00				Compound Not Detected.		
80 4-Chlorophenyl-phenylether	204.00				Compound Not Detected.		
83 4,6-Dinitro-2-methylphenol	198.00				Compound Not Detected.		
84 N-Nitrosodiphenylamine (1)	169.00				Compound Not Detected.		
85 1,2-Diphenylhydrazine	77.00				Compound Not Detected.		
\$ 86 2,4,6-Tribromophenol	329.65	13.741	13.744	(1.151)	59616	150	76
89 4-Bromophenyl-phenylether	248.00				Compound Not Detected.		
90 Hexachlorobenzene	284.00				Compound Not Detected.		
92 Pentachlorophenol	266.00				Compound Not Detected.		
* 95 Phenanthrene-d10	188.00	15.339	15.348	(1.000)	111038	40	
96 Phenanthrene	178.00				Compound Not Detected.		
97 Anthracene	178.00				Compound Not Detected.		
99 Di-n-butylphthalate	149.00				Compound Not Detected.		
102 Fluoranthene	202.00				Compound Not Detected.		
103 Benzidine	184.00				Compound Not Detected.		
104 Pyrene	202.00				Compound Not Detected.		
~ 106 Terphenyl-d14	244.00	19.200	19.203	(0.879)	193778	77	38
110 Butylbenzylphthalate	149.00				Compound Not Detected.		
112 Benzo(a)anthracene	228.00				Compound Not Detected.		
113 3,3'-Dichlorobenzidine	252.00				Compound Not Detected.		
* 114 Chrysene-d12	240.00	21.838	21.848	(1.000)	85881	40	
115 Chrysene	228.00				Compound Not Detected.		
116 bis(2-Ethylhexyl)phthalate	149.00				Compound Not Detected.		
117 Di-n-octylphthalate	149.00				Compound Not Detected.		
118 Benzo(b)fluoranthene	252.00				Compound Not Detected.		
120 Benzo(k)fluoranthene	252.00				Compound Not Detected.		
122 Benzo(a)pyrene	252.00				Compound Not Detected.		
* 123 Perylene-d12	264.00	25.319	25.329	(1.000)	83427	40	
125 Indeno(1,2,3-cd)pyrene	276.00				Compound Not Detected.		
126 Dibenz(a,h)anthracene	278.00				Compound Not Detected.		
127 Benzo(g,h,i)perylene	276.00				Compound Not Detected.		

QC Flag Legend

Q - Qualifier signal failed the ratio test.

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Unknown Compounds Quantitation Report

Data file : /chem/ms3.i/h072596a.b/h0006703.d
Lab Smp Id: MB370006 Client Smp ID: 333-MW03-1D
Inj Date : 25-JUL-1996 16:30
Operator : mjohnson Inst ID: ms3.i
Smp Info : MB370006 333-MW03-1D
Misc Info :
Comment :
Method : /chem/ms3.i/h072596a.b/SV8270.m
Meth Date : 31-Jul-1996 16:11 mjohnson
Cal Date : 25-JUL-1996 09:31 Cal File: h0006693.d
Als bottle: 12
Dil Factor: 1.000 Target Version: 3.10
Integrator: HP RTE Compound Sublist: brown&root.sub
Sample Matrix: WATER
Quantitative Mode : Use RF of Nearest Std

ISTD	RT	AREA	AMOUNT
=====	=====	=====	=====
* 16 1,4-Dichlorobenzene-d4	6.750	263729	40.000
* 95 Phenanthrene-d10	15.339	339363	40.000
* 114 Chrysene-d12	21.838	328230	40.000

CONCENTRATIONS					QUANT		
RT	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	CPND #
=====	=====	=====	=====	=====	=====	=====	=====
✓ 2-Pentanone, 4-hydroxy-4-methyl-					CAS #: 123-42-2		
5.182	50512	8	4	42	NBS75K.1	64274	16
Unknown Alcohol					CAS #: 111-76-2		
5.717	60687	9	5	0		0	16
Unknown Alcohol					CAS #: 111-90-0		
6.516	84596	13	6	0		0	16
Unknown Alcohol					CAS #: 13422-07-7		
6.597	34823	5	3	0		0	16
Unknown <i>hydrocarbon</i>					CAS #:		
16.320	57789	7	3	0		0	95

000259

RT	CONCENTRATIONS				QUANT		CPND #
	AREA	ON-COL(NG)	FINAL(ug/L)	QUAL	LIBRARY	LIB ENTRY	
====	====	=====	=====	====	=====	=====	=====
Unknown	hydrocarbon			CAS #:			
16.401	44183	5	3	0		0	95
Unknown				CAS #:			
19.852	230415	28	14	0		0	114

GC PURGEABLE HALOCARBONS

000380

CASE NARRATIVE
GC PURGEABLE HALOCARBONS

QAL Lab Reference No./SDG. MB370

Project: BROWN & ROOT COASTAL SYSTEMS STATION

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: Not applicable.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 601 (MOD)

IV. PREPARATION

Not applicable.

V. ANALYSIS

- A. Calibration : All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Matrix Spikes: 2-Chloroethyl vinyl ether was outside acceptable limits for Accuracy (% Recovery) and Precision (RPD). However, analysis of a Laboratory Control Sample immediately after the matrix spikes indicated the analytical system was in control for the compounds found in the associated samples. Since MS/MSD results are subject to matrix effects, these values should be considered to be advisory.
- E. Samples: Sample MB370001 (333-MW01-1) contained unidentified, non-target compounds.

Primary analysis utilized a Restek Rtx 502.2 (105 meter x 0.53 mm) column. Confirmation analysis used a J&W Scientific DB-VRX (75 meter x 0.45 mm) column.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Herb Kelly

Herb Kelly

Organic Division Manager

DATE: 08-06-96

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MB370001	333-MW01-1	WATER	7/11/96	N/A	7/19/96	<2
MB370002RE	333-MW02-1	WATER	7/11/96	N/A	7/19/96	<2
MB370003	333-MW03-1	WATER	7/11/96	N/A	7/18/96	<2
MB370003MS	333-MW03-1MS	WATER	7/11/96	N/A	7/19/96	<2
MB370003MSD	333-MW03-1MD	WATER	7/11/96	N/A	7/19/96	<2
MB370004RE	333-PC4-1	WATER	7/11/96	N/A	7/19/96	<2
MB370005	333-MW01-1B	WATER	7/11/96	N/A	7/19/96	<2
MB370006	333-MW03-1D	WATER	7/11/96	N/A	7/18/96	<2
MB370007	TRIP_BLANK	WATER	7/11/96	N/A	7/18/96	<2
WMV096G182	VBLK001	WATER	N/A	N/A	7/18/96	N/A
WMV096G191	VBLK002	WATER	N/A	N/A	7/19/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE HALOCARBONS

Date collected: N/A	Sample Group: LABQC
Date extracted: N/A	Lab Sample ID: Multiple Samples
Date analyzed: 3/13/96	Lab file 1 ID: N/A
Matrix: Water	Lab file 2 ID: N/A
Method: EPA601 (MOD)	Dilution factor: 1.0
% Moisture: 100	Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	0.093
75-25-2	Bromoform	1.0	0.142
74-83-9	Bromomethane	1.0	0.089
56-23-5	Carbon tetrachloride	1.0	0.090
108-90-7	Chlorobenzene	1.0	0.141
75-00-3	Chloroethane	1.0	0.101
110-75-8	2-Chloroethyl vinyl ether	1.0	0.100
67-66-3	Chloroform	1.0	0.086
74-87-3	Chloromethane	1.0	0.138
124-48-1	Dibromochloromethane	1.0	0.106
95-50-1	1,2-Dichlorobenzene	1.0	0.128
541-73-1	1,3-Dichlorobenzene	1.0	0.137
106-46-7	1,4-Dichlorobenzene	1.0	0.145
75-71-8	Dichlorodifluoromethane	1.0	0.181
75-34-3	1,1-Dichloroethane	1.0	0.079
107-06-2	1,2-Dichloroethane	1.0	0.089
75-35-4	1,1-Dichloroethene	1.0	0.138
156-59-2	cis-1,2-Dichloroethene	1.0	0.074
156-60-5	trans-1,2-Dichloroethene	1.0	0.066
78-87-5	1,2-Dichloropropane	1.0	0.097
10061-01-5	cis-1,3-Dichloropropene	1.0	0.095
10061-02-6	trans-1,3-Dichloropropene	1.0	0.113
75-09-2	Methylene chloride (Dichloromethane)	5.0	2.029
79-34-5	1,1,2,2-Tetrachlorethane	1.0	0.214
127-18-4	Tetrachloroethene	1.0	0.104
71-55-6	1,1,1-Trichloroethane	1.0	0.088
79-00-5	1,1,2-Trichloroethane	1.0	0.135
79-01-6	Trichloroethene	1.0	0.091
75-69-4	Trichlorofluoromethane	1.0	0.096
75-01-4	Vinyl chloride	1.0	0.160



333-MW01-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/19/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370001
 Lab file 1 ID: G18T019
 Lab file 2 ID: G18U019
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	1.8
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			101 % Rec.

333-MW02-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/19/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370002RE
 Lab file 1 ID: G19T017
 Lab file 2 ID: G19U017
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			99 % Rec.



333-MW03-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/18/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370003
 Lab file 1 ID: G18T016
 Lab file 2 ID: G18U016
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			99 % Rec.

333-MW03-1MS

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/19/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370003MS
 Lab file 1 ID: G18T026
 Lab file 2 ID: G18U026
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	20
75-25-2	Bromoform	1.0	20
74-83-9	Bromomethane	1.0	20
56-23-5	Carbon tetrachloride	1.0	19
108-90-7	Chlorobenzene	1.0	20
75-00-3	Chloroethane	1.0	20
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	20
74-87-3	Chloromethane	1.0	21
124-48-1	Dibromochloromethane	1.0	21
95-50-1	1,2-Dichlorobenzene	1.0	20
541-73-1	1,3-Dichlorobenzene	1.0	20
106-46-7	1,4-Dichlorobenzene	1.0	19
75-71-8	Dichlorodifluoromethane	1.0	20
75-34-3	1,1-Dichloroethane	1.0	20
107-06-2	1,2-Dichloroethane	1.0	20
75-35-4	1,1-Dichloroethene	1.0	19
156-59-2	cis-1,2-Dichloroethene	1.0	20
156-60-5	trans-1,2-Dichloroethene	1.0	20
78-87-5	1,2-Dichloropropane	1.0	20
10061-01-5	cis-1,3-Dichloropropene	1.0	20
10061-02-6	trans-1,3-Dichloropropene	1.0	20
75-09-2	Methylene chloride (Dichloromethane)	5.0	19
79-34-5	1,1,2,2-Tetrachlorethane	1.0	20
127-18-4	Tetrachloroethene	1.0	20
71-55-6	1,1,1-Trichloroethane	1.0	20
79-00-5	1,1,2-Trichloroethane	1.0	20
79-01-6	Trichloroethene	1.0	20
75-69-4	Trichlorofluoromethane	1.0	20
75-01-4	Vinyl chloride	1.0	20
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			100 % Rec.



333-MW03-1MD

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/19/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370003MSD
 Lab file 1 ID: G18T027
 Lab file 2 ID: G18U027
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	20
75-25-2	Bromoform	1.0	21
74-83-9	Bromomethane	1.0	19
56-23-5	Carbon tetrachloride	1.0	19
108-90-7	Chlorobenzene	1.0	21
75-00-3	Chloroethane	1.0	20
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	20
74-87-3	Chloromethane	1.0	20
124-48-1	Dibromochloromethane	1.0	21
95-50-1	1,2-Dichlorobenzene	1.0	20
541-73-1	1,3-Dichlorobenzene	1.0	20
106-46-7	1,4-Dichlorobenzene	1.0	19
75-71-8	Dichlorodifluoromethane	1.0	20
75-34-3	1,1-Dichloroethane	1.0	20
107-06-2	1,2-Dichloroethane	1.0	20
75-35-4	1,1-Dichloroethene	1.0	19
156-59-2	cis-1,2-Dichloroethene	1.0	20
156-60-5	trans-1,2-Dichloroethene	1.0	19
78-87-5	1,2-Dichloropropane	1.0	20
10061-01-5	cis-1,3-Dichloropropene	1.0	20
10061-02-6	trans-1,3-Dichloropropene	1.0	20
75-09-2	Methylene chloride (Dichloromethane)	5.0	20
79-34-5	1,1,2,2-Tetrachloroethane	1.0	21
127-18-4	Tetrachloroethene	1.0	20
71-55-6	1,1,1-Trichloroethane	1.0	19
79-00-5	1,1,2-Trichloroethane	1.0	21
79-01-6	Trichloroethene	1.0	20
75-69-4	Trichlorofluoromethane	1.0	19
75-01-4	Vinyl chloride	1.0	20
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			100 % Rec.

333-PC4-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/19/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370004RE
 Lab file 1 ID: G19T019
 Lab file 2 ID: G19U019
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			92 % Rec.

333-MW01-1B

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/19/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370005
 Lab file 1 ID: G18T022
 Lab file 2 ID: G18U022
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			103 % Rec.

333-MW03-1D

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/18/96
Matrix: Water
Method: EPA601 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370006
Lab file 1 ID: G18T017
Lab file 2 ID: G18U017
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			102 % Rec.

TRIP_BLANK

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date collected: 7/11/96
 Date extracted: N/A
 Date analyzed: 7/18/96
 Matrix: Water
 Method: EPA601 (MOD)
 % Moisture: 100

Sample Group: MB370
 Lab Sample ID: MB370007
 Lab file 1 ID: G18T018
 Lab file 2 ID: G18U018
 Dilution factor: 1.0
 Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride (Dichloromethane)	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133 %)			98 % Rec.

GC PURGEABLE AROMATICS

4.1

000535

CASE NARRATIVE
GC PURGEABLE AROMATICS

QAL Lab Reference No./SDG. MB370

Project: BROWN & ROOT COASTAL SYSTEMS STATION

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: Not applicable.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 602 (MOD)

IV. PREPARATION

Not applicable.

V. ANALYSIS

- A. Calibration : All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Matrix Spikes: All acceptance criteria were met.
- E. Samples: Sample MB370001 (333-MW01-1) contained unidentified, non-target compounds.

Primary analysis utilized a Restek Rtx 502.2 (105 meter x 0.53 mm) column. Confirmation analysis used a J&W Scientific DB-VRX (75 meter x 0.45 mm) column.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: for James W. Smiley

Herb Kelly
Organic Division Manager

DATE: 08-06-96

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH ¹
MB370001	333-MW01-1	WATER	7/11/96	N/A	7/19/96	<2
MB370002RE	333-MW02-1	WATER	7/11/96	N/A	7/19/96	<2
MB370003	333-MW03-1	WATER	7/11/96	N/A	7/18/96	<2
MB370003MS	333-MW03-1MS	WATER	7/11/96	N/A	7/19/96	<2
MB370003MSD	333-MW03-1MD	WATER	7/11/96	N/A	7/19/96	<2
MB370004RE	333-PC4-1	WATER	7/11/96	N/A	7/19/96	<2
MB370005	333-MW01-1B	WATER	7/11/96	N/A	7/19/96	<2
MB370006	333-MW03-1D	WATER	7/11/96	N/A	7/18/96	<2
MB370007	TRIP BLANK	WATER	7/11/96	N/A	7/18/96	<2
WMV096G182	VBLK001	WATER	N/A	N/A	7/18/96	N/A
WMV096G191	VBLK002	WATER	N/A	N/A	7/19/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE AROMATICS

Date collected:	N/A	Sample Group:	LABQC
Date extracted:	N/A	Lab Sample ID:	Multiple Samples
Date analyzed:	3/13/96	Lab file 1 ID:	N/A
Matrix:	Water	Lab file 2 ID:	N/A
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	0.102
108-90-7	Chlorobenzene	1.0	0.141
95-50-1	1,2-Dichlorobenzene	1.0	0.128
541-73-1	1,3-Dichlorobenzene	1.0	0.137
106-46-7	1,4-Dichlorobenzene	1.0	0.145
100-41-4	Ethylbenzene	1.0	0.129
1634-04-4	tert-butyl methyl ether	1.0	0.087
108-88-3	Toluene	1.0	0.102
108-38-3/106-42-3	m-, p-Xylene	2.0	0.312
95-47-6	o-Xylene	1.0	0.189

Jmf

333-MW01-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/19/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370001
Lab file 1 ID: G18T019
Lab file 2 ID: G18U019
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	1.3
100-41-4	Ethylbenzene	1.0	6.7
1330-20-7	Xylenes (Total)	1.0	6.8
N/A	Total Volatile Organic Aromatics	1.0	15
1634-04-4	Methyl-tert-butyl ether	1.0	9.0
SURROGATE-Fluorobenzene (QC Limits : 61-133%)			101 % Rec.

333-MW02-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/19/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370002RE
Lab file 1 ID: G19T017
Lab file 2 ID: G19U017
Dilution factor: 1.0
Reporting units: ug/L

CAS. NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	U
1634-04-4	Methyl-tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			99 % Rec.

333-MW03-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/18/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370003
Lab file 1 ID: G18T016
Lab file 2 ID: G18U016
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	U
1634-04-4	Methyl-tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			99 % Rec.

333-MW03-1MS

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/19/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370003MS
Lab file 1 ID: G18T026
Lab file 2 ID: G18U026
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	20
108-88-3	Toluene	1.0	20
100-41-4	Ethylbenzene	1.0	20
1330-20-7	Xylenes (Total)	1.0	60
N/A	Total Volatile Organic Aromatics	1.0	N/A
1634-04-4	Methyl-tert-butyl ether	1.0	23
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			100 % Rec.

333-MW03-1MD

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/19/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370003MSD
Lab file 1 ID: G18T027
Lab file 2 ID: G18U027
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	21
108-88-3	Toluene	1.0	21
100-41-4	Ethylbenzene	1.0	20
1330-20-7	Xylenes (Total)	1.0	61
N/A	Total Volatile Organic Aromatics	1.0	N/A
1634-04-4	Methyl-tert-butyl ether	1.0	24
SURROGATE-Fluorobenzene (QC Limits - 61-133 %)			100 % Rec.



CLIENT SAMPLE ID

333-PC4-1

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/19/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370004RE
Lab file 1 ID: G19T019
Lab file 2 ID: G19U019
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	U
1634-04-4	Methyl-tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			92 % Rec.

333-MW01-1B

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected: 7/11/96
Date extracted: N/A
Date analyzed: 7/19/96
Matrix: Water
Method: EPA602 (MOD)
% Moisture: 100

Sample Group: MB370
Lab Sample ID: MB370005
Lab file 1 ID: G18T022
Lab file 2 ID: G18U022
Dilution factor: 1.0
Reporting units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	1.4
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	1.4
1634-04-4	Methyl-tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			103 % Rec.

TRIP_BLANK

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date collected:	7/11/96	Sample Group:	MB370
Date extracted:	N/A	Lab Sample ID:	MB370007
Date analyzed:	7/18/96	Lab file 1 ID:	G18T018
Matrix:	Water	Lab file 2 ID:	G18U018
Method:	EPA602 (MOD)	Dilution factor:	1.0
% Moisture:	100	Reporting units:	ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	1.8
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Xylenes (Total)	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	1.8
1634-04-4	Methyl-tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			98 % Rec.

GC EXTRACTABLE VOLATILE ORGANICS
(EDB)

000039

CASE NARRATIVE
GC EXTRACTABLE VOLATILE ORGANICS (EDB)

QAL Lab Reference No./SDG. MB370

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 504.1

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Water matrix spikes were performed using a sample from this contract. The summary of the MS, MSD, and the associated blank spike results have been included in this data package.

E. Samples: Sample analysis proceeded normally.

A summary of current applicable method detection limits (MDLs) immediately follows this case narrative.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey
Chemist

DATE: _____

7/31/96

CASE NARRATIVE

Addendum

Sample Information

LAB	CLIENT	SAMPLE	DATE	DATE	DATE	SAMPLE
<u>SAMPLE ID</u>	<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLED</u>	<u>EXTRACTED</u>	<u>ANALYZED</u>	<u>pH</u> ¹
MB370001	333-MW01-1	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370002	333-MW02-1	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370003	333-MW03-1	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370003MS	333-MW03-1MS	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370003MSD	333-MW03-1MD	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370004	333-PC4-1	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370005	333-MW01-1B	WATER	07/11/96	07/29/96	07/29/96	N/A
MB370006	333-MW03-1D	WATER	07/11/96	07/29/96	07/29/96	N/A
W07296B1	QC BLANK	WATER	N/A	07/29/96	07/29/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

Laboratory Name: CH2M HILL
Analytical Method: 504.1

Sample Matrix: WATER

<u>CAS Number</u>	<u>Compound</u>	<u>MDL</u> <u>ug/L</u>
106-93-4	1,2-Dibromoethane (EDB)	0.003

ORGANICS ANALYSIS DATA SHEET

Laboratory Name:	<u>CH2M HILL</u>	Concentration:	<u>LOW</u>	Date Extracted:	<u>07/29/96</u>
Lab Sample ID:	<u>MB370001</u>	Sample Matrix:	<u>WATER</u>	Date Analyzed:	<u>07/29/96</u>
Client Sample ID:	<u>333-MW01-1</u>	Percent Moisture:	<u> </u>	Dilution Factor:	<u>1.0</u>

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CAS Number	ug/L
106-93-4 1,2-Dibromoethane (EDB)	0.02 U

1,1,2,2-Tetrachloroethane - SS 96

- U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

000635

ORGANICS ANALYSIS DATA SHEET

aboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/29/96
Lab Sample ID: MB370002 Sample Matrix: WATER Date Analyzed: 07/29/96
Client Sample ID: 333-MW02-1 Percent Moisture: Dilution Factor: 1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

<u>CAS Number</u>	<u>ug/L</u>
106-93-4 1,2-Dibromoethane (EDB) . . .	0.02 U

1,1,2,2-Tetrachloroethane - SS 87

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/29/96
Lab Sample ID: MB370003 Sample Matrix: WATER Date Analyzed: 07/29/96
Client Sample ID: 333-MW03-1 Percent Moisture: _____ Dilution Factor: 1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CAS Number ug/L
106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 94

- U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments: -

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/29/96
 Lab Sample ID: MB370004 Sample Matrix: WATER Date Analyzed: 07/29/96
 Client Sample ID: 333-PC4-1 Percent Moisture: Dilution Factor: 1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

CAS Number ug/L
 106-93-4 1,2-Dibromoethane (EDB) . . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 98

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

Laboratory Name: <u>CH2M HILL</u>	Concentration: <u>LOW</u>	Date Extracted: <u>07/29/96</u>
Lab Sample ID: <u>MB370005</u>	Sample Matrix: <u>WATER</u>	Date Analyzed: <u>07/29/96</u>
Client Sample ID: <u>333-MW01-1B</u>	Percent Moisture: <u> </u>	Dilution Factor: <u>1.0</u>

<u>CAS Number</u>	<u>ug/L</u>
106-93-4 1,2-Dibromoethane (EDB)	0.02 U

000707

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 07/29/96
 Lab Sample ID: MB370006 Sample Matrix: WATER Date Analyzed: 07/29/96
 Client Sample ID: 333-MW03-1D Percent Moisture: Dilution Factor: 1.0

GC EXTRACTABLE VOLATILE ORGANICS (EDB)

<u>CAS Number</u>	<u>ug/L</u>
106-93-4 1,2-Dibromoethane (EDB)	. . . 0.02 U

1,1,2,2-Tetrachloroethane - SS 95

- U - Analyzed for but not detected.
- B - Detected in QC blank.
- J - Detected, concentration estimated.
- SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

GC POLYNUCLEAR AROMATIC HYDROCARBONS

000763

CASE NARRATIVE
GC POLYNUCLEAR AROMATIC HYDROCARBONS

QAL Lab Reference No./SDG. MB370

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: EPA 610

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

Both the initial calibration and continuing calibration summaries include data for both the primary and confirmation columns. Each compound will appear in the summary reports twice. The first time the compound will not be preceded by the "#" symbol, referring to compounds identified from the first column (RTX-5); the next time it will have the "#" symbol, referring to compounds identified from the second column (RTX-200) (for example, Naphthalene and #Naphthalene).

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Matrix spikes were performed using a sample from this contract. The summary of the MS/MSD results has been included in this data package.

E. Samples: Sample analysis proceeded normally.

A summary of current applicable method detection limits (MDLs) immediately follows this case narrative.

- F. Other: Primary and confirmation data were simultaneously acquired using two dissimilar analytical columns (RTX-5 and RTX-200) connected in parallel to one injection port and one detector.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey
Chemist III

DATE: _____

7/31/96

CASE NARRATIVE

Addendum

Sample Information

LAB	CLIENT	SAMPLE	DATE	DATE	DATE	SAMPLE
<u>SAMPLE ID</u>	<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLED</u>	<u>EXTRACTED</u>	<u>ANALYZED</u>	<u>pH</u> ¹
MB370001	333-MW01-1	WATER	07/11/96	07/15/96	07/25/96	N/A
MB370002	333-MW02-1	WATER	07/11/96	07/15/96	07/25/96	N/A
MB370003	333-MW03-1	WATER	07/11/96	07/15/96	07/25/96	N/A
MB370003MS	333-MW03-1MS	WATER	07/11/96	07/17/96	07/25/96	N/A
MB370003MSD	333-MW03-1MD	WATER	07/11/96	07/17/96	07/25/96	N/A
MB370004	333-PC4-1	WATER	07/11/96	07/15/96	07/25/96	N/A
MB370005	333-MW01-1B	WATER	07/11/96	07/15/96	07/25/96	N/A
MB370006	333-MW03-1D	WATER	07/11/96	07/15/96	07/25/96	N/A
W07156B1	NBLK06	WATER	N/A	07/15/96	07/24/96	N/A
W07176B1	NBLK07	WATER	N/A	07/17/96	07/25/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS METHOD DETECTION LIMITS

POLYNUCLEAR AROMATIC HYDROCARBON (PNA) COMPOUNDS

Laboratory Name: CH2M HILL Sample Matrix: WATER
 Analytical Method: 610 Extraction: SEPARATORY FUNNEL

<u>Compound</u>	<u>MDL</u> <u>ug/L</u>
Naphthalene	0.57
2-Methylnaphthalene	0.47
1-Methylnaphthalene	0.42
Acenaphthylene	0.38
Acenaphthene	0.41
Fluorene	0.38
Phenanthrene	0.51
Anthracene	0.32
Fluoranthene	0.60
Pyrene	0.27
Benzo (a) anthracene	0.24
Chrysene	0.49
Benzo (b) fluoranthene	0.40
Benzo (k) fluoranthene	0.39
Benzo (a) pyrene	0.33
Indeno (123-cd) pyrene	0.40
Dibenzo (ah) anthracene	0.30
Benzo (ghi) perylene	0.27

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MB370001
Client Sample ID: 333-MW01-1

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1005mL

Date Extracted: 07/15/96
Date Analyzed: 07/25/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	2 U
91-57-6	2-Methylnaphthalene . . .	2 U
90-12-0	1-Methylnaphthalene . . .	2 U
208-96-8	Acenaphthylene	2 U
83-32-9	Acenaphthene	2 U
86-73-7	Fluorene.	2 U
85-01-8	Phenanthrene.	2 U
120-12-7	Anthracene.	2 U
206-44-0	Fluoranthene.	2 U
129-00-0	Pyrene.	2 U
56-55-3	Benzo(a)anthracene. . . .	2 U
218-01-9	Chrysene.	2 U
205-99-2	Benzo(b)fluoranthene . .	2 U
207-08-9	Benzo(k)fluoranthene . .	2 U
50-32-8	Benzo(a)pyrene.	2 U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2 U
53-70-3	Dibenzo(a,h)anthracene. .	2 U
191-24-2	Benzo(g,h,i)perylene. . .	2 U
	Terphenyl-d14 - SS	58 %

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MB370002
Client Sample ID: 333-MW02-1

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1055mL

Date Extracted: 07/15/96
Date Analyzed: 07/25/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	2 U
91-57-6	2-Methylnaphthalene . . .	2 U
90-12-0	1-Methylnaphthalene . . .	2 U
208-96-8	Acenaphthylene	2 U
83-32-9	Acenaphthene	2 U
86-73-7	Fluorene.	2 U
85-01-8	Phenanthrene.	2 U
120-12-7	Anthracene.	2 U
206-44-0	Fluoranthene.	2 U
129-00-0	Pyrene.	2 U
56-55-3	Benzo(a)anthracene. . . .	2 U
218-01-9	Chrysene.	2 U
205-99-2	Benzo(b)fluoranthene . .	2 U
207-08-9	Benzo(k)fluoranthene . .	2 U
50-32-8	Benzo(a)pyrene.	2 U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2 U
53-70-3	Dibenzo(a,h)anthracene. .	2 U
191-24-2	Benzo(g,h,i)perylene. . .	2 U
Terphenyl-d14 - SS		72 %

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MB370003
Client Sample ID: 333-MW03-1

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1065mL

Date Extracted: 07/15/96
Date Analyzed: 07/25/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	2 U
91-57-6	2-Methylnaphthalene . . .	2 U
90-12-0	1-Methylnaphthalene . . .	2 U
208-96-8	Acenaphthylene	2 U
83-32-9	Acenaphthene	2 U
86-73-7	Fluorene	2 U
85-01-8	Phenanthrene	2 U
120-12-7	Anthracene	2 U
206-44-0	Fluoranthene	2 U
129-00-0	Pyrene	2 U
56-55-3	Benzo(a)anthracene . . .	2 U
218-01-9	Chrysene	2 U
205-99-2	Benzo(b)fluoranthene . .	2 U
207-08-9	Benzo(k)fluoranthene . .	2 U
50-32-8	Benzo(a)pyrene	2 U
193-39-5	Indeno(1,2,3-cd)pyrene . .	2 U
53-70-3	Dibenzo(a,h)anthracene . .	2 U
191-24-2	Benzo(g,h,i)perylene . . .	2 U
	Terphenyl-d14 - SS	72 %

U - Analyzed for but not detected.
B-- Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MB370004
Client Sample ID: 333-PC4-1

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1020mL

Date Extracted: 07/15/96
Date Analyzed: 07/25/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene . . .	2	U
90-12-0	1-Methylnaphthalene . . .	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene.	2	U
85-01-8	Phenanthrene.	2	U
120-12-7	Anthracene.	2	U
206-44-0	Fluoranthene.	2	U
129-00-0	Pyrene.	2	U
56-55-3	Benzo(a)anthracene. . . .	2	U
218-01-9	Chrysene.	2	U
205-99-2	Benzo(b)fluoranthene . .	2	U
207-08-9	Benzo(k)fluoranthene . .	2	U
50-32-8	Benzo(a)pyrene.	2	U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2	U
53-70-3	Dibenzo(a,h)anthracene. .	2	U
191-24-2	Benzo(g,h,i)perylene. . .	2	U
Terphenyl-d14 - SS		74	%

U - Analyzed for but not detected.

B ~ Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MB370005
Client Sample ID: 333-MW01-1B

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1045mL

Date Extracted: 07/15/96
Date Analyzed: 07/25/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene . . .	2	U
90-12-0	1-Methylnaphthalene . . .	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene	2	U
85-01-8	Phenanthrene	2	U
120-12-7	Anthracene	2	U
206-44-0	Fluoranthene	2	U
129-00-0	Pyrene	2	U
56-55-3	Benzo(a)anthracene	2	U
218-01-9	Chrysene	2	U
205-99-2	Benzo(b)fluoranthene . .	2	U
207-08-9	Benzo(k)fluoranthene . .	2	U
50-32-8	Benzo(a)pyrene	2	U
193-39-5	Indeno(1,2,3-cd)pyrene . .	2	U
53-70-3	Dibenzo(a,h)anthracene . .	2	U
191-24-2	Benzo(g,h,i)perylene . . .	2	U
	Terphenyl-d14 - SS	70	%

U - Analyzed for but not detected.
B ~ Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MB370006
Client Sample ID: 333-MW03-1D

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1025mL

Date Extracted: 07/15/96
Date Analyzed: 07/25/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L	
91-20-3	Naphthalene	2	U
91-57-6	2-Methylnaphthalene . . .	2	U
90-12-0	1-Methylnaphthalene . . .	2	U
208-96-8	Acenaphthylene	2	U
83-32-9	Acenaphthene	2	U
86-73-7	Fluorene.	2	U
85-01-8	Phenanthrene.	2	U
120-12-7	Anthracene.	2	U
206-44-0	Fluoranthene.	2	U
129-00-0	Pyrene.	2	U
56-55-3	Benzo(a)anthracene. . . .	2	U
218-01-9	Chrysene.	2	U
205-99-2	Benzo(b)fluoranthene . .	2	U
207-08-9	Benzo(k)fluoranthene . .	2	U
50-32-8	Benzo(a)pyrene.	2	U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2	U
53-70-3	Dibenzo(a,h)anthracene. .	2	U
191-24-2	Benzo(g,h,i)perylene. . .	2	U
	Terphenyl-d14 - SS	75	%

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

CATIONS DATA PACKAGE

000001

CASE NARRATIVE
Cations

Laboratory: CH2M HILL Lab Ref. No.: MB370

Client/Project: Brown & Root Coastal Systems Station

I. Holding Time:
All holding times were met.

II. Digestion Exceptions:
None.

III. Analysis:

A. Calibration:
All acceptance criteria were met.

B. Blanks:
All acceptance criteria were met.

C. ICP Interference Check Sample:
All acceptance criteria were met.

D. Spike Sample(s):
All acceptance criteria were met.

E. Duplicate Sample(s):
All acceptance criteria were met.

F. Laboratory Control Sample(s):
All acceptance criteria were met.

G. ICP Serial Dilution:
All acceptance criteria were met.

H. Other:
None.

IV. Receipt Exceptions:
Any receipt exception will be addressed in a Sample Receipt Exception Report which will be attached to the Chain-of-Custody in this package.

V. Documentation Exceptions:
None.

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and Quality Analytical Laboratories, Inc., both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Kaye Walker DATE: 7/31/96
Kaye Walker
Inorganic Division Manager

000002

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

333-MW01-1

Lab Name: CH2M_HILL Contract: MB370

Lab Code: MGM_____ Case No.: MB370_ SAS No.: MB370_ SDG No.: MB370_

Matrix (soil/water): WATER Lab Sample ID: MB370001

Level (low/med): LOW__ Date Received: 07/13/96

% Solids: 0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: BROWN_____ Clarity Before: CLOUDY Texture: N/A_____

Color After: YELLOW____ Clarity After: CLEAR____ Artifacts: _____

Comments:

1

INORGANIC ANALYSES DATA SHEET

333-MW02-1

% Solids: 0

1
INORGANIC ANALYSES DATA SHEET

333-MW03-1

1

INORGANIC ANALYSES DATA SHEET

333-PC4-1

1

INORGANIC ANALYSES DATA SHEET

333-MW01-1B

% Solids: 0

1

INORGANIC ANALYSES DATA SHEET

333-MW03-1D

GENERAL CHEMISTRY

000295

CASE NARRATIVE
GENERAL CHEMISTRY

QAL Lab Reference No./SDG. MB370

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited in the corresponding Form I.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

- A. Calibration : All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Spikes: All acceptance criteria were met.
- D. Duplicates: All acceptance criteria were met.
- E. Laboratory Control Samples: All acceptance criteria were met.
- F. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Velinda Herbert DATE: 7/20/96
Velinda Herbert
General Organic/Inorganic Chemist

Report of Analytical Results

Client Sample ID: 333-MW01-1
 Sample Description: GRAB
 Sample Matrix: Water

Date Collected: 07/11/96 (Thursday)
 Date Received: 07/13/96 (Saturday)

Lab Reference No: MB370
 Lab Sample ID: MB370001

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	0.08	mg/L	0.05	07/23/96	EPA418.1

[Signature]
 (6545)

Report of Analytical Results

Client Sample ID: 333-MW02-1
 Sample Description: GRAB
 Sample Matrix: Water

Date Collected: 07/11/96 (Thursday)
 Date Received: 07/13/96 (Saturday)

Lab Reference No: MB370
 Lab Sample ID: MB370002

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	1.1	mg/L	0.05	07/23/96	EPA418.1

[Signature]
 (6545)

Report of Analytical Results

Client Sample ID: 333-MW03-1
Sample Description: GRAB
Sample Matrix: Water

Date Collected: 07/11/96 (Thursday)
Date Received: 07/13/96 (Saturday)

Lab Reference No: MB370
Lab Sample ID: MB370003

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	07/23/96	EPA418.1

(6545)

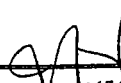
Report of Analytical Results

Client Sample ID: 333-PC4-1
Sample Description: GRAB
Sample Matrix: Water

Date Collected: 07/11/96 (Thursday)
Date Received: 07/13/96 (Saturday)

Lab Reference No: MB370
Lab Sample ID: MB370004

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	07/23/96	EPA418.1


 16545

Report of Analytical Results

Client Sample ID: 333-MW01-1B
Sample Description: GRAB
Sample Matrix: Water

Date Collected: 07/11/96 (Thursday)
Date Received: 07/13/96 (Saturday)

Lab Reference No: MB370
Lab Sample ID: MB370005

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	07/23/96	EPA418.1

(6545)

Report of Analytical Results

Client Sample ID: 333-MW03-1D
Sample Description: GRAB
Sample Matrix: Water

Date Collected: 07/11/96 (Thursday)
Date Received: 07/13/96 (Saturday)

Lab Reference No: MB370
Lab Sample ID: MB370006

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.05	mg/L	0.05	07/23/96	EPA418.1

6545

**Brown & Root
Environmental**455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)SITE MANAGER: G. GoodePROJECT NAME: CTD 0008BRE PROJECT NO.: 7113 CODE: _____

P.O. NO.: _____

SHIPPED TO: _____

PAGE 1 OF 1Quality Analytical
Montgomery ALA
(LABORATORY NAME, CITY)**CHAIN OF CUSTODY RECORD**SAMPLED BY (PRINT): Charlie BurginSAMPLER SIGNATURE: [Signature]

LAB NO.	DATE	TIME	SAMPLE IDENTIFICATION	SAMPLE TYPE		MATRIX
				COMP.	GRAB	
	7-11-96	1714	333-GW-MW01-001		-	GW
		1602	333-GW-MW02-001		-	GW
		1801	333-GW-MW03-001		-	GW
		1530	333-PCY-155-001		-	GW
		1645	333-GW-MW01-001B		-	AFW
		1801	333-GW-MW03-001D		-	GW
			Trip Blank			
			Temp Blank			

LABORATORY ANALYSISPRES. TYPE: HC1 HC4 HC4 N/A HC4 N/A N/A N/A N/A N/A
PARAMETERS: 601 602 8260 504 TRPH 8270 610 Residual 8270 8270
NUMBER OF CONTAINERS: 1
STANDARD TAT ☐ RUSH
☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS
RESULTS DUE DATE: _____**COMMENTS:**Samples ICED**FOR LAB USE ONLY**LAB# MB 370
PROJ# _____
ACK _____ VERIFIED _____
HAZWRAP/NEESA Y N
GC LEVEL 1 2 3
COC _____ ICE _____
ANA REQ _____ TEMP _____
GLST SEAL _____ PH _____
SAMPLE COND. _____**TOTAL NUMBER OF CONTAINERS**

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)		SEAL INTACT?	DATE: <u>6/26/96</u>	EMPTY BOTTLES RECEIVED BY (SIGNATURE)		SEAL INTACT?	DATE: <u>7-10-96</u>
① <u>Michael D. Shine</u>		<u>YES</u> NO N/A	TIME: <u>9:00 AM</u>	② <u>[Signature]</u>		<u>YES</u> NO N/A	TIME: <u>1200</u>
RELINQUISHED BY (SIGNATURE)		SEAL INTACT?	DATE: <u>7-12-96</u>	RECEIVED BY (SIGNATURE)		SEAL INTACT?	DATE:
③ <u>[Signature]</u>		<u>YES</u> NO N/A	TIME: <u>1530</u>	④ <u>Fed Ex</u>		YES NO N/A	TIME:
RELINQUISHED BY (SIGNATURE)		SEAL INTACT?	DATE:	RECEIVED BY (SIGNATURE)		SEAL INTACT?	DATE: <u>7-13-96</u>
⑤ <u>[Signature]</u>		YES NO N/A	TIME:	⑥ <u>David Shine</u>		<u>YES</u> NO N/A	TIME: <u>09:00 AM</u>

SPECIAL INSTRUCTIONS:**LABORATORY REMARKS:**

SAMPLE CONTAINERS PRECLEANED BY: <input type="checkbox"/> BRE <input type="checkbox"/> LABORATORY <input checked="" type="checkbox"/> MANUFACTURER		METHOD OF SHIPMENT: <u>Fed Ex</u>		BILL OF LADING NO.: _____	
WHITE-FULLY EXECUTED COPY YELLOW-RECEIVING LABORATORY COPY PINK-SAMPLERS' COPY/QA COPY GOLDENROD-SITE MANAGERS' COPY		SAMPLING TEAM: <u>C. Burgin</u>		RECEIVED FOR LABORATORY BY (SIGNATURE): <u>Billy Lee</u> DATE: <u>7/13/96</u> TIME: <u>09:00</u>	

No. **0063**

Sample Receipt Exceptions Report

Batch Number: MB 370

Origination date: 7/13/96

Client/Project: Brown & Root Environmental

SUMMARY OF EXCEPTION (check one if it applies)

✓	Description of exception	Comments (write number of exception description and the impacted sample numbers)
	1. No custody seal as required by the project.	Sample ID 333-GW-PCY-1SS-001
	2. No chain-of-custody provided.	this COC lists 16 containers, but
	3. Chain-of-custody provided but incomplete.	one 504 EOB container is missing.
✓	4. Samples broken or leaking on receipt.	Sample ID 333-GW-PCY-1SS-001
	5. Temperature of samples inappropriate for analysis requested.	lists two containers for GID analysis,
	6. Container inappropriate for analysis requested.	but one container is broken.
	7. Inadequate sample volume for analysis requested.	
	8. Preservation inappropriate for analysis requested.	
	9. Samples received out of holding time for analysis requested.	
	10. Samples received more than 72 hours after sampling.	
	11. Discrepancies between chain-of-custody and container labels.	
✓	12. Other (describe on right)	

FRACTION(S) AFFECTED (specify which fraction was affected by the exceptions detailed above by writing the number of the exception next to it)

Unpreserved	<input type="checkbox"/>	Nutrients	<input type="checkbox"/>	Metals	<input type="checkbox"/>	Volatiles	<input type="checkbox"/>
Cyanide	<input type="checkbox"/>	Extractables	<input checked="" type="checkbox"/>	Extractables	<input type="checkbox"/>	Other (specify)	<input type="checkbox"/>

ACTION TAKEN:

Originator: David Shine Supervisor: _____

Client was notified on: 7/15 Client contact: Terry Good

Client's comments: Proceed w/ analysis - add Pb furnace to metals

Client Services: ARM QA officer: _____

Sample Receipt Exceptions Report

Batch Number: MB370

Origination date: 7/15/96

Client/Project: Brown and Root

SUMMARY OF EXCEPTION (check one if it applies)

✓	Description of exception	Comments (write number of exception description and the impacted sample numbers)
	1. No custody seal as required by the project.	Extra Containers w/out labels.
	2. No chain-of-custody provided.	7 sets of vials
	3. Chain-of-custody provided but incomplete.	5 EAB bottles
	4. Samples broken or leaking on receipt.	2-2 liter (1 broken)
	5. Temperature of samples inappropriate for analysis requested.	2 metals (1 liter)
	6. Container inappropriate for analysis requested.	3-1 liter amber (10)
	7. Inadequate sample volume for analysis requested.	2-1 liter amber wide mouth
	8. Preservation inappropriate for analysis requested.	
	9. Samples received out of holding time for analysis requested.	
	10. Samples received more than 72 hours after sampling.	
	11. Discrepancies between chain-of-custody and container labels.	
	12. Other (describe on right)	

FRACTION(S) AFFECTED (specify which fraction was affected by the exceptions detailed above by writing the number of the exception next to it)

Unpreserved	<input type="text"/>	Nutrients	<input type="text"/>	Metals	<input type="text"/>	Volatiles	<input type="text"/>
Cyanide	<input type="text"/>	Extractables	<input type="text"/>	Extractables	<input type="text"/>	Other (specify)	<input type="text"/>

ACTION TAKEN:

Originator: _____ Supervisor: _____

Client was notified on: 7/15 Client contact: Jerry G...

Client's comments: Use these samples for MS/MSD for MW-03

Client Services: RA QA officer: _____

GROUNDWATER SAMPLES COLLECTED NOVEMBER 25, 1996

CATIONS DATA PACKAGE

000001

CASE NARRATIVE
Cations

Laboratory: CH2M HILL

Lab Ref. No.: MC484

Client/Project: BROWN & ROOT CTO00008

I. Holding Time:

All holding times were met.

II. Digestion Exceptions:

None.

III. Analysis:

A. Calibration:

All acceptance criteria were met.

B. Blanks:

All acceptance criteria were met.

C. ICP Interference Check Sample:

All acceptance criteria were met.

D. Spike Sample(s):

All acceptance criteria were met.

E. Duplicate Sample(s):

All acceptance criteria were met.

F. Laboratory Control Sample(s):

All acceptance criteria were met.

G. ICP Serial Dilution:

All acceptance criteria were met.

H. Other:

None.

IV. Receipt Exceptions:

Any receipt exception will be addressed in a Sample Receipt Exception Report which will be attached to the Chain-of-Custody in this package.

V. Documentation Exceptions:

None.

VI. I certify that this data package is in compliance with the terms and conditions agreed to by the client and Quality Analytical Laboratories, Inc., both technically and for completeness, except for the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

SIGNED: Kaye Walker

Kaye Walker / Inorganic Division Mgr

DATE: 1/3/97

000002

MW02-002

Lab Name: CH2M HILL Contract: MC484

Lab Code: MGM Case No.: MC484 SAS No.: MC484 SDG No.: MC484

Matrix (soil/water): WATER Lab Sample ID: MC484001

Level (low/med): LOW Date Received: 11/27/96

% Solids: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

[illegible]

Color Before: BROWN_____ Clarity Before: CLEAR_____ Texture: N/A_____

Color After: BROWN_____ Clarity After: CLEAR_____ Artifacts: _____

Comments:

1

INORGANIC ANALYSES DATA SHEET

TW01-001B

1

INORGANIC ANALYSES DATA SHEET

TW01-001

1

INORGANIC ANALYSES DATA SHEET

MW04-001

Concentration Units (ug/L or mg/kg dry weight): UG/L

000007

GENERAL CHEMISTRY

000235

CASE NARRATIVE
GENERAL CHEMISTRY

QAL Lab Reference No./SDG. MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

All holding times were met.

III. METHOD

The method used is cited in the corresponding Form I.

IV. PREPARATION

Sample preparation proceeded normally, if applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Spikes: There is no matrix spike data available because spiked sample was overrange and inadvertently discarded. However, a post extraction matrix spike was performed and is included in this package.

D. Duplicates: All acceptance criteria were met.

E. Laboratory Control Samples: All acceptance criteria were met.

F. Samples: Sample analyses proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED:

Velinda Herbert

Velinda Herbert

General Organic/Inorganic Chemist

DATE:

12/20/96

Report of Analytical Results

Client Sample ID: TW01-0018
 Sample Description: 333-GW
 Sample Matrix: Water
 Site: N/A

Date Collected: 11/25/96 12:15 (Mon)
 Date Received: 11/27/96 10:00 (Wed)

Reference No: MC484
 Lab Sample ID: MC484002

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	< 0.06	mg/L	0.05	12/11/96 00:00	EPA418.1

41-1(8196)

Report of Analytical Results

Client Sample ID: TW01-001
Sample Description: 333-GW
Sample Matrix: Water
Site: N/A

Date Collected: 11/25/96 13:20 (Mon)
Date Received: 11/27/96 10:00 (Wed)

Reference No: MC484
Lab Sample ID: MC484003

CATEGORY NAME Analytical Parameter	Result	Units	Reporting Level	Date/Time of Analysis	Analytical Method(s)
DEMAND AND GENERAL ORGANIC Total Petroleum Hydrocarbons	19.2	mg/L	0.25	12/11/96 00:00	EPA418.1

(8196)

**CASE NARRATIVE
GC/MS VOLATILE ORGANICS**

QAL Lab Reference No./SDG. MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

- A. Sample Preparation: Not applicable.
- B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A
Cleanup: N/A
Analysis: SW-846 8260

IV. PREPARATION

Not applicable.

V. ANALYSIS

- A. Calibration: All acceptance criteria were met.
- B. Blanks: All acceptance criteria were met.
- C. Surrogates: All acceptance criteria were met.
- D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MC484 (MC484003MS and MC484003MSD). All acceptance criteria were met. A copy of the results has been included for your review.
- E. Samples: Sample analysis proceeded normally.
- F. Other: Please note that the Form 1's reflect the specified target list.

Because this laboratory has only recently begun analyzing samples by the 8260 method, there are not yet enough data collected to produce control charts for the water surrogate recoveries for 1,2-Dichloroethane-d4. This control chart is currently in the process of being developed.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Ward DickensDATE: 12-26-96

Ward Dickens
Laboratory Director

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MC484002	TW01-001B	WATER	11/25/96	N/A	12/04/96	<2
MC484003	TW01-001	WATER	11/25/96	N/A	12/04/96	<2
MC484003MS	TW01-001MS	WATER	11/25/96	N/A	12/04/96	<2
MC484003MSD	TW01-001MSD	WATER	11/25/96	N/A	12/04/96	<2
MC484004	MW04-001	WATER	11/25/96	N/A	12/06/96	<2
X12046B1	VLKB3	WATER	N/A	N/A	12/04/96	N/A
X12066B1	VLKB8	WATER	N/A	N/A	12/06/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001B

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484002

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: C1VO040841.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____

Date Analyzed: 12/04/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	10	U
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW01-001B

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484002

Sample wt/vol: 5.0

(g/mL) ML

Lab File ID: C1VO040841.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____

Data Analyzed: 12/04/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1. _____	_____	_____	_____	_____
2. _____	_____	_____	_____	_____
3. _____	_____	_____	_____	_____
4. _____	_____	_____	_____	_____
5. _____	_____	_____	_____	_____
6. _____	_____	_____	_____	_____
7. _____	_____	_____	_____	_____
8. _____	_____	_____	_____	_____
9. _____	_____	_____	_____	_____
10. _____	_____	_____	_____	_____
11. _____	_____	_____	_____	_____
12. _____	_____	_____	_____	_____
13. _____	_____	_____	_____	_____
14. _____	_____	_____	_____	_____
15. _____	_____	_____	_____	_____
16. _____	_____	_____	_____	_____
17. _____	_____	_____	_____	_____
18. _____	_____	_____	_____	_____
19. _____	_____	_____	_____	_____
20. _____	_____	_____	_____	_____
21. _____	_____	_____	_____	_____
22. _____	_____	_____	_____	_____
23. _____	_____	_____	_____	_____
24. _____	_____	_____	_____	_____
25. _____	_____	_____	_____	_____
26. _____	_____	_____	_____	_____
27. _____	_____	_____	_____	_____
28. _____	_____	_____	_____	_____
29. _____	_____	_____	_____	_____
30. _____	_____	_____	_____	_____

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484003

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: C2VO040842.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____

Date Analyzed: 12/04/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	2	J
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	10	U
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TW01-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484003

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: C2VO040842.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____

Data Analyzed: 12/04/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.	Unknown Alkane	17.067	7	J
2.	Unknown	18.667	9	J
3. 496-11-7	Indane	18.850	18	NJ
4.	1H-Indene dihydro methyl iso	21.050	10	J
5.	Unknown	21.817	7	J
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1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW04-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484004

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: C2VO040864.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____

Date Analyzed: 12/06/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

74-87-3-----	Chloromethane	10	U
75-01-4-----	Vinyl chloride	10	U
74-83-9-----	Bromomethane	10	U
75-00-3-----	Chloroethane	10	U
75-69-4-----	Trichlorofluoromethane	10	U
75-35-4-----	1,1-Dichloroethene	10	U
75-09-2-----	Methylene chloride	10	U
75-34-3-----	1,1-Dichloroethane	10	U
67-66-3-----	Chloroform	10	U
71-55-6-----	1,1,1-Trichloroethane	10	U
56-23-5-----	Carbon tetrachloride	10	U
71-43-2-----	Benzene	3	J
107-06-2-----	1,2-Dichloroethane	10	U
79-01-6-----	Trichloroethene	10	U
78-87-5-----	1,2-Dichloropropane	10	U
75-27-4-----	Bromodichloromethane	10	U
110-75-8-----	2-Chloroethylvinyl ether	10	U
10061-01-5-----	cis-1,3-Dichloropropene	10	U
108-88-3-----	Toluene	10	U
10061-02-6-----	trans-1,3-Dichloropropene	10	U
79-00-5-----	1,1,2-Trichloroethane	10	U
127-18-4-----	Tetrachloroethene	10	U
124-48-1-----	Dibromochloromethane	10	U
108-90-7-----	Chlorobenzene	10	U
100-41-4-----	Ethylbenzene	7	J
75-25-2-----	Bromoform	10	U
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

MW04-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484004

Sample wt/vol: 5.0

(g/mL) ML

Lab File ID: C2V0040864.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____

Data Analyzed: 12/06/96

Column: (pack/cap) CAP

Dilution Factor: 1.0

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====
1.	Unknown Alkane	17.083	65	J
2.	Unknown Alkane	17.817	90	J
3.	Unknown	18.767	110	J
4.	Unknown Aromatic Hydrocarbon	19.033	48	J
5.	Unknown Alkane	19.633	52	J
6. 119-64-2	Naphthalene, 1,2,3,4-tetrahy	21.433	66	NJ
7.	Naphthalene tetrahydro methy	23.183	61	J
8.	Unknown Aromatic Hydrocarbon	23.400	66	J
9.	Naphthalene methyl isomer	24.017	80	J
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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW04-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484004

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0701007.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1-----	4,6-Dinitro-2-methylphenol	500	U
86-30-6-----	N-Nitrosodiphenylamine (3)	100	U
122-66-7-----	1,2-Diphenylhydrazine	100	U
101-55-3-----	4-Bromophenyl-phenylether	100	U
118-74-1-----	Hexachlorobenzene	100	U
87-86-5-----	Pentachlorophenol	500	U
85-01-8-----	Phenanthrene	160	
120-12-7-----	Anthracene	24	J
84-74-2-----	Di-n-butylphthalate	100	U
206-44-0-----	Fluoranthene	11	J
92-87-5-----	Benzidine	100	U
129-00-0-----	Pyrene	41	J
85-68-7-----	Butylbenzylphthalate	100	U
56-55-3-----	Benzo(a)anthracene	100	U
91-94-1-----	3,3'-Dichlorobenzidine	200	U
218-01-9-----	Chrysene	100	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	12	JB
117-84-0-----	Di-n-octylphthalate	100	U
205-99-2-----	Benzo(b)fluoranthene	100	U
207-08-9-----	Benzo(k)fluoranthene	100	U
50-32-8-----	Benzo(a)pyrene	100	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	100	U
53-70-3-----	Dibenz(a,h)anthracene	100	U
191-24-2-----	Benzo(g,h,i)perylene	100	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000187

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW04-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484004

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0701007.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 10.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Alkane	6.659	110	J
2.	Unknown PAH	6.795	160	J
3.	Unknown Alkane	6.938	190	J
4. 3877-19-8	Naphthalene, 1,2,3,4-tetrahy	7.388	170	NJ
5.	Unknown Hydrocarbon	7.474	200	J
6.	Unknown	7.667	170	J
7. 1680-51-9	Naphthalene, 1,2,3,4-tetrahy	7.845	160	NJ
8. 91-57-6	Naphthalene, 2-methyl-	8.160	200	NJ
9. 90-12-0	Naphthalene, 1-methyl-	8.345	330	NJ
10.	Unknown PAH	8.431	220	J
11.	Unknown Hydrocarbon	8.667	140	J
12.	Naphthalene dimethyl isomer	9.260	350	J
13.	Naphthalene dimethyl isomer	9.432	340	J
14.	Unknown PAH	10.432	140	J
15.	Naphthalene trimethyl isomer	10.539	310	J
16.	Naphthalene trimethyl isomer	10.596	160	J
17.	Naphthalene trimethyl isomer	10.775	250	J
18.	Unknown Alkane	12.104	500	J
19.	Unknown PAH	12.525	260	J
20.	Unknown Alkane	13.176	700	J
21.				
22.				
23.				
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GC EXTRACTABLE VOLATILE ORGANICS
(EDB)

000617

CASE NARRATIVE
GC EXTRACTABLE VOLATILE ORGANICS (EDB)

QAL Lab Reference No./SDG. MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A

Cleanup: N/A

Analysis: EPA 504.1

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Matrix spikes were performed using a sample from this contract. The associated blank spike (LCS) is summarized with the MS/MSD results on the Form 3 in this report.

E. Samples: Sample analysis proceeded normally.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey
Chemist

DATE: _____

12/23/96

CASE NARRATIVE

Addendum

Sample Information

LAB	CLIENT	SAMPLE	DATE	DATE	DATE	SAMPLE
<u>SAMPLE ID</u>	<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLED</u>	<u>EXTRACTED</u>	<u>ANALYZED</u>	<u>pH</u> ¹
MC484002	TW01-001B	WATER	11/25/96	12/20/96	12/20/96	N/A
MC484003	TW01-001	WATER	11/25/96	12/20/96	12/20/96	N/A
MC484003MS	TW01-001MS	WATER	11/25/96	12/20/96	12/20/96	N/A
MC484003MSD	TW01-001MSD	WATER	11/25/96	12/20/96	12/20/96	N/A
MC484004	MW04-001	WATER	11/25/96	12/20/96	12/20/96	N/A
W12206B1	QC BLANK	WATER	N/A	12/20/96	12/20/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

Laboratory Name: CH2M HILL Concentration: LOW Date Extracted: 12/20/96
Lab Sample ID: MC484002 Sample Matrix: WATER Date Analyzed: 12/20/96
Client Sample ID: TW01-001B Percent Moisture: _____ Dilution Factor: 1.0

CAS Number	ug/L
106-93-4 1,2-Dibromoethane (EDB)	0.02 U

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

000621

Date Extracted: 12/20/96
Date Analyzed: 12/20/96
Dilution Factor: 1.0

Concentration: LOW
Sample Matrix: WATER
Percent Moisture: _____

CAS Number	ug/L
106-93-4 1,2-Dibromoethane (EDB)	0.02 U

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MC484004
Client Sample ID: MW04-001

Concentration: LOW
Sample Matrix: WATER
Percent Moisture: _____

Date Extracted: 12/20/96
Date Analyzed: 12/20/96
Dilution Factor: 1.0

EDB

CAS Number	ug/L
106-93-4 1,2-Dibromoethane (EDB)	0.02 U

1,1,2,2-Tetrachloroethane - SS 100

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments :

Form I

Quality Analytical
Laboratories, Inc.

2567 Fairlane Drive, Montgomery, AL 36116
P.O. Box 231148, Montgomery, AL 36123

(334) 271-2440
Fax No. (334) 271-3428
000627

GC POLYNUCLEAR AROMATIC HYDROCARBONS

000575

CASE NARRATIVE
GC POLYNUCLEAR AROMATIC HYDROCARBONS

QAL Lab Reference No./SDG. MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: N/A

Cleanup: N/A

Analysis: 610

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

Both the initial calibration and continuing calibration summaries include data for both the primary and confirmation columns. Each compound will appear in the summary reports twice. The first time the compound will not be preceded by the "#" symbol, referring to compounds identified from the first column (RTX-5); the next time it will have the "#" symbol, referring to compounds identified from the second column (RTX-200) (for example, Naphthalene and #Naphthalene).

B. Blanks: All acceptance criteria were met.

C. Surrogates: Surrogate recovery could not be determined for sample MC484004 due to the dilution required for analysis. All other acceptance criteria were met.

D. Spikes: Matrix spikes were performed using a sample from this contract. MC484003MS and MC484003MSD were diluted for analysis due to native contents. Therefore some recoveries are inflated by co-eluting non-target peaks. Recovery of Benzo(k)fluoranthene could not be determined due to the dilution required for analysis. The associated blank spike (LCS) is additionally summarized on the Form 3 in this report.

- E. Samples: Samples MC484003, MC484004, MC484003MS, and MC484003MSD were diluted for analysis due to non-target interference. Sample analysis proceeded normally.

The report limit for Phenanthrene was raised for sample MC484004 due to chromatographic interference.

Frequently interferences will persist in the extract even after cleanup procedures. Standard cleanup procedures are designed to recover the target compounds and remove interfering non-targets. Precise rules for diluting interferences are difficult to develop. A single non-target peak could be allowed to saturate the detector. However, extracts with multiple non-target peaks might elevate the baseline or alter the baseline noise for part of the chromatogram. If the baseline were severely elevated or noise obstructed the target chromatographic region, targets at or near the report limit could not be positively identified within the interfering peaks. Because GC identification is based largely on retention time, regions with many peaks (noisy regions) will frequently have many false positives. For samples with such chromatographic interference, positive hits are typically not reported unless the peak is significantly above the surrounding noise and/or is not obstructed on one or both analytical columns. In addition, such interferences can be damaging to the chromatography and on-going calibration criteria can not be achieved. Without dilution, report limits would usually be raised in samples with significant interference. Therefore, such samples are typically diluted to minimize interferences and yet achieve the best possible report limits.

- F. Other: Primary and confirmation data were simultaneously acquired using two dissimilar analytical columns (RTX-5 and RTX-200) connected in parallel to one injection port and one detector.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: _____

Tammy Carey
Tammy Carey
Chemist

DATE: 12/23/96

CASE NARRATIVE

Addendum

Sample Information

LAB	CLIENT	SAMPLE	DATE	DATE	DATE	SAMPLE
<u>SAMPLE ID</u>	<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLED</u>	<u>EXTRACTED</u>	<u>ANALYZED</u>	<u>pH</u> ¹
MC484002	TW01-001B	WATER	11/25/96	11/30/96	12/18/96	N/A
MC484003	TW01-001	WATER	11/25/96	11/30/96	12/18/96	N/A
MC484003MS	TW01-001MS	WATER	11/25/96	11/30/96	12/18/96	N/A
MC484003MSD	TW01-001MSD	WATER	11/25/96	11/30/96	12/18/96	N/A
MC484004	MW04-001	WATER	11/25/96	11/30/96	12/18/96	N/A
W11306B1	QC BLANK	WATER	N/A	11/30/96	12/18/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MC484002
Client Sample ID: TW01-001B

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1025mL

Date Extracted: 11/30/96
Date Analyzed: 12/18/96
Dilution Factor: 1.0

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	2 U
91-57-6	2-Methylnaphthalene . . .	2 U
90-12-0	1-Methylnaphthalene . . .	2 U
208-96-8	Acenaphthylene	2 U
83-32-9	Acenaphthene	2 U
86-73-7	Fluorene.	2 U
85-01-8	Phenanthrene.	2 U
120-12-7	Anthracene.	2 U
206-44-0	Fluoranthene.	2 U
129-00-0	Pyrene.	2 U
56-55-3	Benzo(a)anthracene. . . .	2 U
218-01-9	Chrysene.	2 U
205-99-2	Benzo(b)fluoranthene . .	2 U
207-08-9	Benzo(k)fluoranthene . .	2 U
50-32-8	Benzo(a)pyrene.	2 U
193-39-5	Indeno(1,2,3-cd)pyrene. .	2 U
53-70-3	Dibenzo(a,h)anthracene. .	2 U
191-24-2	Benzo(g,h,i)perylene. . .	2 U
Terphenyl-d14 - SS		66 %

U - Analyzed for but not detected.

B - Detected in QC blank.

J - Detected, concentration estimated.

SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MC484003
Client Sample ID: TW01-001

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 990mL

Date Extracted: 11/30/96
Date Analyzed: 12/18/96
Dilution Factor: 5.0

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	10 U
91-57-6	2-Methylnaphthalene . . .	10 U
90-12-0	1-Methylnaphthalene . . .	10 U
208-96-8	Acenaphthylene	10 U
83-32-9	Acenaphthene	10 U
86-73-7	Fluorene.	10 U
85-01-8	Phenanthrene.	10 U
120-12-7	Anthracene.	10 U
206-44-0	Fluoranthene.	10 U
129-00-0	Pyrene.	10 U
56-55-3	Benzo(a)anthracene. . . .	10 U
218-01-9	Chrysene.	10 U
205-99-2	Benzo(b)fluoranthene . .	10 U
207-08-9	Benzo(k)fluoranthene . .	10 U
50-32-8	Benzo(a)pyrene.	10 U
193-39-5	Indeno(1,2,3-cd)pyrene. .	10 U
53-70-3	Dibenzo(a,h)anthracene. .	10 U
191-24-2	Benzo(g,h,i)perylene. . .	10 U
Terphenyl-d14 - SS		60 %

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments:

Form I

ORGANICS ANALYSIS DATA SHEET

Laboratory Name: CH2M HILL
Lab Sample ID: MC484004
Client Sample ID: MW04-001

Concentration: LOW
Sample Matrix: WATER
Volume Extracted: 1031mL

Date Extracted: 11/30/96
Date Analyzed: 12/18/96
Dilution Factor: 100

PNA COMPOUNDS

CAS Number		ug/L
91-20-3	Naphthalene	200 U
91-57-6	2-Methylnaphthalene . . .	340
90-12-0	1-Methylnaphthalene . . .	330
208-96-8	Acenaphthylene	200 U
83-32-9	Acenaphthene	200 U
86-73-7	Fluorene.	200 U
85-01-8	Phenanthrene.	400 UI
120-12-7	Anthracene.	200 U
206-44-0	Fluoranthene.	200 U
129-00-0	Pyrene.	200 U
56-55-3	Benzo(a)anthracene. . . .	200 U
218-01-9	Chrysene.	200 U
205-99-2	Benzo(b)fluoranthene . .	200 U
207-08-9	Benzo(k)fluoranthene . .	200 U
50-32-8	Benzo(a)pyrene.	200 U
193-39-5	Indeno(1,2,3-cd)pyrene. .	200 U
53-70-3	Dibenzo(a,h)anthracene. .	200 U
191-24-2	Benzo(g,h,i)perylene. . .	200 U

Terphenyl-d14 - SS DL

U - Analyzed for but not detected.
B - Detected in QC blank.
J - Detected, concentration estimated.
SS - Surrogate Standard reported as percent recovery.

Comments: DL - Surrogate recovery not determined due to dilution.

Form I

Chain of custody documentation



Brown & Root Environmental

455 FAIRWAY DRIVE, SUITE 200
DEERFIELD BEACH, FLORIDA 33441
(305) 570-5885 (305) 570-5974 (FAX)

SITE MANAGER: Gerald F. Goode
PROJECT NAME: CTO 0008
BRE PROJECT NO.: 7113 CODE: -
P.O. NO.: 2049-7113-P96249

SHIPPED TO: Quality Analysis PAGE 1 OF 1
hcb
Montgomery, AL
(LABORATORY NAME, CITY)

CHAIN OF CUSTODY RECORD

SAMPLED BY (PRINT): Gerald F. Goode
SAMPLER SIGNATURE: Gerald F. Goode

SAMPLE
TYPE

COMP.

GRAB

MATRIX

LAB NO. DATE TIME SAMPLE IDENTIFICATION

001 11/25/96 12:10 333-GW-MW02-002

002 11/25/96 12:15 333-GW-TW01-001B

003 11/25/96 13:20 333-GW-TW01-001

004 11/25/96 14:45 333-GW-MW04-001

FOR LAB USE ONLY

LAB # MC484

PRG # 1

ACK VERIFIED

HAZWRAP/NETSA Y N

NO LEVEL 1 2 3

DOC MC ICE

ANA REG TEMP

CUST SEAL PH

SAMPLE CONT

TOTAL NUMBER OF CONTAINERS

LABORATORY ANALYSIS

PRES.
TYPE

HCL

HCL

HCL

MA

MA

MA

MND

MND

TPH

NUMBER OF CONTAINERS

☒ STANDARD TAT ☐ RUSH
☐ 24 HR. ☐ 48 HR. ☐ 72 HR. ☐ 7 DAYS

RESULTS DUE DATE: 12/18/96

COMMENTS:

Sample ICED
NOTE: Product layer detected in well MW04 during purging of well.
NOTE: Sample Volumes collected for Laboratory QA, at TW01 Matrix spike, Matrix Spike Replicate & Duplicate 96
Total Containers Shipped: 97
NOTE: 40ml vial for MSD cracked could only collect 2-40ml vial Sample MSD.

EMPTY BOTTLES RELINQUISHED BY (SIGNATURE)

①

SEAL INTACT?

YES NO N/A

DATE:

TIME:

EMPTY BOTTLES RECEIVED BY (SIGNATURE)

② Gerald F. Goode

SEAL INTACT?

(YES) NO N/A

DATE: 11/22/96

TIME: 11:30

RELINQUISHED BY (SIGNATURE)

③ Gerald F. Goode

SEAL INTACT?

(YES) NO N/A

DATE: 11/26/96

TIME: 11:00

RECEIVED BY (SIGNATURE)

④ Federal Express

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RELINQUISHED BY (SIGNATURE)

⑤

SEAL INTACT?

YES NO N/A

DATE:

TIME:

RECEIVED BY (SIGNATURE)

⑥ Paul Amundson

SEAL INTACT?

(YES) NO N/A

DATE: 11/27/96

TIME: 1000

SPECIAL INSTRUCTIONS:

LABORATORY REMARKS:

0907282762
0907282773
0907282751

SAMPLE CONTAINERS PRECLEANED BY:

☐ BRE ☐ LABORATORY ☒ MANUFACTURER

METHOD OF SHIPMENT: Federal Express

Bill of Lading NO.: 7113

WHITE-FULLY EXECUTED COPY
YELLOW-RECEIVING LABORATORY COPY
PINK-SAMPLERS' COPY/QA COPY
GOLDENROD-SITE MANAGERS' COPY

SAMPLING TEAM:

Gerald Goode

RECEIVED FOR LABORATORY
BY (SIGNATURE):

DATE:

TIME:

No. 0097

000783

Sample Receipt Record

Batch Number:

MC484

Date received:

11/27/94

Client/Project:

Brown + Root

VERIFICATION OF SAMPLE CONDITIONS (verify all items)

Observation	YES	NO
Were custody seals intact and on the outside of the cooler?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Was the Chain of Custody inside the cooler?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Was the Chain of Custody properly filled out?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Were the sample containers in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Was there ice in the cooler? Enter temperature of temperature blank or icewater: 4 °C	<input checked="" type="checkbox"/>	<input type="checkbox"/>

If the answer to any of the questions above is NO, a Sample Receipt Exceptions Report must be written.

VERIFICATION OF SAMPLE PRESERVATION (verify all preserved samples)

Sample No	Nutrients pH < 2	Metals pH < 2	Volatiles pH < 2	Cyanide pH > 12	Other (specify) TPH	Other (specify)
01		< 2				
02		< 2	< 2		< 2	
03		< 2	< 2		< 2	
04		< 2	< 2		< 2	
05						
06						
07						
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						

LOGIN AND pH VERIFICATIONS PERFORMED BY

Billy Swart

11/27/94

Date

Date

QAL Montgomery

MV 8260
ARE
HCE

11/25/94

SPLERECT.DOC (2/10/96)

000700

GC PURGEABLE HALOCARBONS

000327

CASE NARRATIVE
GC PURGEABLE HALOCARBONS

QAL Lab Reference No./SDG: MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: N/A

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation:

Cleanup: N/A

Analysis: EPA 601 (Mod)

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: Recovery of 2-chloroethyl vinyl ether (2-CEVE) was low in both matrix spikes which is not unusual for acid preserved samples. The laboratory control sample analyzed immediately after the matrix spikes was not preserved with acid and provided good recovery of 2-CEVE. All other recoveries were within the advisory limits.

E. Samples: Sample analysis proceeded normally. Primary analysis was performed using a J&W DB-VRX analytical column (75 m x 0.45 mm ID). Confirmational analyses were performed using a Restek Rtx-502.2 analytical column (105 m x 0.53 mm ID).

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person as verified by the following signature.

SIGNED: *Herb Kelly*

for Herb Kelly
Organic Division Manager

DATE: 12-20-96

CASE NARRATIVE
Addendum

Sample Information

LAB SAMPLE ID	CLIENT SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	DATE EXTRACTED	DATE ANALYZED	SAMPLE pH ¹
MC484002	TW01-001B	WATER	11/25/96	N/A	12/02/96	<2
MC484003	TW01-001	WATER	11/25/96	N/A	12/02/96	<2
MC484003MS	TW01-001MS	WATER	11/25/96	N/A	12/02/96	<2
MC484003MSD	TW01-001MSD	WATER	11/25/96	N/A	12/02/96	<2
MC484004	MW04-001	WATER	11/25/96	N/A	12/02/96	<2
X12026B1	VBLK001	WATER	N/A	N/A	12/02/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

CURRENT METHOD DETECTION LIMITS (MDLs)
PURGEABLE HALOCARBONS

Date Collected: N/A
Date Extracted: N/A
Date Analyzed: 12/20/96

Matrix: Water
Method: EPA 601 (Mod)
% Moisture: 100

Sample Group: Lab QC
Lab Sample ID: Multiple Samples
Lab File 1 ID: N/A
Lab File 2 ID: N/A
Dilution Factor: 1.0
Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	0.178
75-25-2	Bromoform	1.0	0.362
74-83-9	Bromomethane	1.0	0.143
56-23-5	Carbon tetrachloride	1.0	0.191
108-90-7	Chlorobenzene	1.0	0.746
75-00-3	Chloroethane	1.0	0.085
110-75-8	2-Chloroethyl vinyl ether	1.0	0.059
67-66-3	Chloroform	1.0	0.064
74-87-3	Chloromethane	1.0	0.148
124-48-1	Dibromochloromethane	1.0	0.069
95-50-1	1,2-Dichlorobenzene	1.0	0.298
541-73-1	1,3-Dichlorobenzene	1.0	0.319
106-46-7	1,4-Dichlorobenzene	1.0	0.358
75-71-8	Dichlorodifluoromethane	1.0	0.195
75-34-3	1,1-Dichloroethane	1.0	0.128
107-06-2	1,2-Dichloroethane	1.0	0.043
75-35-4	1,1-Dichloroethene	1.0	0.125
156-59-2	cis-1,2-Dichloroethene	1.0	0.054
156-60-5	trans-1,2-Dichloroethene	1.0	0.153
78-87-5	1,2-Dichloropropane	1.0	0.155
10061-01-5	cis-1,3-Dichloropropene	1.0	0.091
10061-02-6	trans-1,3-Dichloropropene	1.0	0.038
75-09-2	Methylene chloride	5.0	0.512
79-34-5	1,1,2,2-Tetrachlorethane	1.0	0.113
127-18-4	Tetrachloroethene	1.0	0.281
71-55-6	1,1,1-Trichloroethane	1.0	0.173
79-00-5	1,1,2-Trichloroethane	1.0	0.077
79-01-6	Trichloroethene	1.0	0.147
75-69-4	Trichlorofluoromethane	1.0	0.112
75-01-4	Vinyl chloride	1.0	0.180

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: 11/25/96	Sample Group: MC484
Date Extracted: N/A	Lab Sample ID: MC484002
Date Analyzed: 12/02/96	Lab File 1 ID: N02V012
Matrix: Water	Lab File 2 ID: N02W012
Method: EPA 601 (Mod)	Dilution Factor: 1.0
% Moisture: 100	Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

101 % Rec.

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: 11/25/96
Date Extracted: N/A
Date Analyzed: 12/02/96
Matrix: Water
Method: EPA 601 (Mod)
% Moisture: 100

Sample Group: MC484
Lab Sample ID: MC484003
Lab File 1 ID: N02V013
Lab File 2 ID: N02W013
Dilution Factor: 1.0
Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	1.4

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

97 % Rec.

REPORT OF ANALYTICAL RESULTS
PURGEABLE HALOCARBONS

Date Collected: 11/25/96
Date Extracted: N/A
Date Analyzed: 12/02/96
Matrix: Water
Method: EPA 601 (Mod)
% Moisture: 100

Sample Group: MC484
Lab Sample ID: MC484004
Lab File 1 ID: N02V011
Lab File 2 ID: N02W011
Dilution Factor: 1.0
Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
75-27-4	Bromodichloromethane	1.0	U
75-25-2	Bromoform	1.0	U
74-83-9	Bromomethane	1.0	U
56-23-5	Carbon tetrachloride	1.0	U
108-90-7	Chlorobenzene	1.0	U
75-00-3	Chloroethane	1.0	U
110-75-8	2-Chloroethyl vinyl ether	1.0	U
67-66-3	Chloroform	1.0	U
74-87-3	Chloromethane	1.0	U
124-48-1	Dibromochloromethane	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
75-71-8	Dichlorodifluoromethane	1.0	U
75-34-3	1,1-Dichloroethane	1.0	U
107-06-2	1,2-Dichloroethane	1.0	U
75-35-4	1,1-Dichloroethene	1.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	U
156-60-5	trans-1,2-Dichloroethene	1.0	U
78-87-5	1,2-Dichloropropane	1.0	U
10061-01-5	cis-1,3-Dichloropropene	1.0	U
10061-02-6	trans-1,3-Dichloropropene	1.0	U
75-09-2	Methylene chloride	5.0	U
79-34-5	1,1,2,2-Tetrachlorethane	1.0	U
127-18-4	Tetrachloroethene	1.0	U
71-55-6	1,1,1-Trichloroethane	1.0	U
79-00-5	1,1,2-Trichloroethane	1.0	U
79-01-6	Trichloroethene	1.0	U
75-69-4	Trichlorofluoromethane	1.0	U
75-01-4	Vinyl chloride	1.0	U

SURROGATE-Fluorobenzene (QC Limits - 61-133%)

65 % Rec.

GC PURGEABLE AROMATICS

000486

**CASE NARRATIVE
GC PURGEABLE AROMATICS**

QAL Lab Reference No./SDG: MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: N/A

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation:

Cleanup: N/A

Analysis: EPA 602 (Mod)

IV. PREPARATION

Not applicable.

V. ANALYSIS

A. Calibration : All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: All acceptance criteria were met.

D. Spikes: All acceptance criteria were met.

E. Samples: Sample analysis proceeded normally. Primary analysis was performed using a J&W DB-VRX analytical column (75 m x 0.45 mm ID). Confirmational analyses were performed using a Restek Rtx-502.2 analytical column (105 m x 0.53 mm ID).

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Herb Kelly

Herb Kelly
Herb Kelly

Organic Division Manager

DATE: 12-20-96

CASE NARRATIVE
Addendum

Sample Information

LAB	CLIENT	SAMPLE	DATE	DATE	DATE	SAMPLE
<u>SAMPLE ID</u>	<u>SAMPLE ID</u>	<u>MATRIX</u>	<u>SAMPLED</u>	<u>EXTRACTED</u>	<u>ANALYZED</u>	<u>pH¹</u>
MC484002	TW01-001B	WATER	11/25/96	N/A	12/02/96	<2
MC484003	TW01-001	WATER	11/25/96	N/A	12/02/96	<2
MC484003MS	TW01-001MS	WATER	11/25/96	N/A	12/02/96	<2
MC484003MSD	TW01-001MSD	WATER	11/25/96	N/A	12/02/96	<2
MC484004	MW04-001	WATER	11/25/96	N/A	12/02/96	<2
X12026B1	VBLK001	WATER	N/A	N/A	12/02/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 11/25/96

Date Extracted: N/A

Date Analyzed: 12/02/96

Matrix: Water

Method: EPA 602 (Mod)

% Moisture: 100

Sample Group: MC484

Lab Sample ID: MC484002

Lab File 1 ID: N02V012

Lab File 2 ID: N02W012

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	U
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Total Xylenes	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	U
1634-04-4	Methyl tert-butyl ether	1.0	1.3
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			101 % Rec.

CLIENT SAMPLE ID

TW01-001

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 11/25/96

Date Extracted: N/A

Date Analyzed: 12/02/96

Matrix: Water

Method: EPA 602 (Mod)

% Moisture: 100

Sample Group: MC484

Lab Sample ID: MC484003

Lab File 1 ID: N02V013

Lab File 2 ID: N02W013

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	2.2
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	U
1330-20-7	Total Xylenes	1.0	U
N/A	Total Volatile Organic Aromatics	1.0	2.2
1634-04-4	Methyl tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			97 % Rec.

CLIENT SAMPLE ID

MW04-001

REPORT OF ANALYTICAL RESULTS
PURGEABLE AROMATICS

Date Collected: 11/25/96

Date Extracted: N/A

Date Analyzed: 12/02/96

Matrix: Water

Method: EPA 602 (Mod)

% Moisture: 100

Sample Group: MC484

Lab Sample ID: MC484004

Lab File 1 ID: N02V011

Lab File 2 ID: N02W011

Dilution Factor: 1.0

Reporting Units: ug/L

CAS NUMBER	COMPOUND NAME	REPORTING LIMIT	RESULT
71-43-2	Benzene	1.0	1.8
108-88-3	Toluene	1.0	U
100-41-4	Ethylbenzene	1.0	4.7
1330-20-7	Total Xylenes	1.0	2.6
N/A	Total Volatile Organic Aromatics	1.0	9.1
1634-04-4	Methyl tert-butyl ether	1.0	U
SURROGATE-Fluorobenzene (QC Limits - 61-133%)			65 % Rec.

GC/MS SEMIVOLATILE ORGANICS

000121

CASE NARRATIVE
GC/MS SEMIVOLATILE ORGANICS

QAL Lab Reference No./SDG. MC484

Project: Brown & Root Coastal Systems Station

I. RECEIPT

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

II. HOLDING TIMES

A. Sample Preparation: All holding times were met.

B. Sample Analysis: All holding times were met.

III. METHOD

Preparation: SW-846 3520A

Cleanup: N/A

Analysis: SW-846 8270A

IV. PREPARATION

Sample preparation proceeded normally.

V. ANALYSIS

A. Calibration: All acceptance criteria were met.

B. Blanks: All acceptance criteria were met.

C. Surrogates: The surrogate recovery for Terphenyl-d14 was lower than QC criteria in samples MC484003MS and MC484003MSD. All other surrogate recoveries were within QC criteria.

D. Spikes: As requested, the matrix spikes were performed using a sample from sample delivery group MC484 (MC484003MS and MC484003MSD). All acceptance criteria were met. A copy of the results has been included for your review.

E. Samples: Sample MC484004 was analyzed at a dilution due to nontarget compounds. One set of data is reported for this sample.

F. Other: Please note that the Form 1's reflect the specified target list.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and QAL, Inc., both technically and for completeness except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

SIGNED: Ward Dickens

Ward Dickens

Laboratory Director

DATE: 12-26-96

CASE NARRATIVE
Addendum

Sample Information

<u>LAB</u> <u>SAMPLE ID</u>	<u>CLIENT</u> <u>SAMPLE ID</u>	<u>SAMPLE</u> <u>MATRIX</u>	<u>DATE</u> <u>SAMPLED</u>	<u>DATE</u> <u>EXTRACTED</u>	<u>DATE</u> <u>ANALYZED</u>	<u>SAMPLE</u> <u>pH¹</u>
MC484002	TW01-001B	WATER	11/25/96	11/30/96	12/05/96	N/A
MC484003	TW01-001	WATER	11/25/96	11/30/96	12/05/96	N/A
MC484003MS	TW01-001MS	WATER	11/25/96	11/30/96	12/05/96	N/A
MC484003MSD	TW01-001MSD	WATER	11/25/96	11/30/96	12/05/96	N/A
MC484004	MW04-001	WATER	11/25/96	11/30/96	12/05/96	N/A
C11306B2	SBLKRE	WATER	N/A	11/30/96	12/05/96	N/A

¹ Applies to samples designated for purgeable VOA analysis only.

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001B

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0501005.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9	N-Nitrosodimethylamine	10	U
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl) ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
108-60-1	2,2'-Oxybis(1-chloroprop (1)	10	U
621-64-7	N-Nitroso-di-n-propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
111-91-1	bis(2-Chloroethoxy) methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
91-58-7	2-Chloronaphthalene	10	U
131-11-3	Dimethylphthalate	10	U
606-20-2	2,6-Dinitrotoluene	10	U
208-96-8	Acenaphthylene	10	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
121-14-2	2,4-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
86-73-7	Fluorene	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000126

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001B

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0501005.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N pH: 6.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	6	JB
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	52	B
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000127

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001B

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484002

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0501005.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N

pH: 6.0

Dilution Factor: 1.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Ketone	3.713	2	JB
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.242	5	NJB
3. 21460-36-6	2-Propanol, 1-(2-propenyloxy	4.277	12	NJ
4.	Unknown	4.435	4	JB
5. 111-90-0	Ethanol, 2-(2-ethoxyethoxy) -	5.535	5	NJ
6.	Unknown	5.614	5	JB
7.	Unknown	5.721	2	J
8. 822-86-6	Cyclohexane, 1,2-dichloro-,	6.142	4	NJB
9. 617-94-7	Benzenemethanol, .alpha.,.al	6.207	3	NJ
10.	Benzene diisocyanato methyl	8.600	4	JB
11.	Unknown	14.474	2	J
12. 10546-70-0	Benzamide, N-propyl-	19.283	3	NJ
13.	Unknown	19.390	6	J
14.	Unknown	20.840	3	J
15.	Unknown	21.276	5	J
16.	Unknown	24.256	2	J
17.	Unknown	24.363	6	J
18.	Unknown Phthalate	24.642	4	J
19.	Unknown Phthalate	25.206	10	J
20.	Unknown	25.828	360	J
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484003

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0601006.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
62-75-9-----	N-Nitrosodimethylamine_____	10	U
108-95-2-----	Phenol_____	10	U
111-44-4-----	bis(2-Chloroethyl) ether_____	10	U
95-57-8-----	2-Chlorophenol_____	10	U
541-73-1-----	1,3-Dichlorobenzene_____	10	U
106-46-7-----	1,4-Dichlorobenzene_____	10	U
95-50-1-----	1,2-Dichlorobenzene_____	10	U
108-60-1-----	2,2'-Oxybis(1-chloroprop_(1)_____	10	U
621-64-7-----	N-Nitroso-di-n-propylamine_____	10	U
67-72-1-----	Hexachloroethane_____	10	U
98-95-3-----	Nitrobenzene_____	10	U
78-59-1-----	Isophorone_____	10	U
88-75-5-----	2-Nitrophenol_____	10	U
105-67-9-----	2,4-Dimethylphenol_____	10	U
111-91-1-----	bis(2-Chloroethoxy) methane_____	10	U
120-83-2-----	2,4-Dichlorophenol_____	10	U
120-82-1-----	1,2,4-Trichlorobenzene_____	10	U
91-20-3-----	Naphthalene_____	10	U
87-68-3-----	Hexachlorobutadiene_____	10	U
59-50-7-----	4-Chloro-3-methylphenol_____	10	U
88-06-2-----	2,4,6-Trichlorophenol_____	10	U
91-58-7-----	2-Chloronaphthalene_____	10	U
131-11-3-----	Dimethylphthalate_____	10	U
606-20-2-----	2,6-Dinitrotoluene_____	10	U
208-96-8-----	Acenaphthylene_____	10	U
83-32-9-----	Acenaphthene_____	10	U
51-28-5-----	2,4-Dinitrophenol_____	50	U
100-02-7-----	4-Nitrophenol_____	50	U
121-14-2-----	2,4-Dinitrotoluene_____	10	U
84-66-2-----	Diethylphthalate_____	10	U
86-73-7-----	Fluorene_____	10	U
7005-72-3-----	4-Chlorophenyl-phenylether_____	10	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000156

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484003

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0601006.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS:	
		(ug/L or ug/Kg) UG/L	Q
534-52-1-----	4,6-Dinitro-2-methylphenol	50	U
86-30-6-----	N-Nitrosodiphenylamine (3)	10	U
122-66-7-----	1,2-Diphenylhydrazine	10	U
101-55-3-----	4-Bromophenyl-phenylether	10	U
118-74-1-----	Hexachlorobenzene	10	U
87-86-5-----	Pentachlorophenol	50	U
85-01-8-----	Phenanthrene	10	U
120-12-7-----	Anthracene	10	U
84-74-2-----	Di-n-butylphthalate	3	JB
206-44-0-----	Fluoranthene	10	U
92-87-5-----	Benzidine	10	U
129-00-0-----	Pyrene	10	U
85-68-7-----	Butylbenzylphthalate	10	U
56-55-3-----	Benzo(a)anthracene	10	U
91-94-1-----	3,3'-Dichlorobenzidine	20	U
218-01-9-----	Chrysene	10	U
117-81-7-----	bis(2-Ethylhexyl)phthalate	7	JB
117-84-0-----	Di-n-octylphthalate	10	U
205-99-2-----	Benzo(b)fluoranthene	10	U
207-08-9-----	Benzo(k)fluoranthene	10	U
50-32-8-----	Benzo(a)pyrene	10	U
193-39-5-----	Indeno(1,2,3-cd)pyrene	10	U
53-70-3-----	Dibenz(a,h)anthracene	10	U
191-24-2-----	Benzo(g,h,i)perylene	10	U

(3) - Cannot be separated from Diphenylamine

FORM I SV-2

SW846

000157

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TW01-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484003

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0601006.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N

pH: 7.0

Dilution Factor: 1.0

Number TICs found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	Unknown Ketone	3.713	6	JB
2. 123-42-2	2-Pentanone, 4-hydroxy-4-met	4.241	22	NJB
3.	Unknown	4.434	4	JB
4. 112-36-7	Ethane, 1,1'-oxybis[2-ethoxy	5.542	4	NJB
5. 822-86-6	Cyclohexane, 1,2-dichloro-,	6.142	5	NJB
6.	Unknown	6.321	4	J
7. 2039-89-6	Benzene, 2-ethenyl-1,4-dimet	6.799	3	NJ
8.	Unknown	6.942	3	J
9.	Unknown	7.057	4	J
10.	Unknown	7.178	3	J
11.	Unknown	7.614	4	J
12.	Unknown	8.250	4	J
13.	Unknown Aromatic	8.343	3	J
14.	Unknown	8.400	4	J
15.	Unknown	8.457	4	J
16. 480-63-7	Benzoic acid, 2,4,6-trimethy	9.193	3	NJ
17.	Unknown	9.257	4	J
18.	Unknown	9.800	6	J
19.	Unknown	10.751	7	J
20.	Unknown	11.330	12	J
21.				
22.				
23.				
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28.				
29.				
30.				

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MW04-001

Lab Name: CH2M HILL

Contract: MC484

Lab Code: MGM

Case No.: MC484

SAS No.:

SDG No.: MC484

Matrix: (soil/water) WATER

Lab Sample ID: MC484004

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 05DEC0701007.D

Level: (low/med) LOW

Date Received: 11/27/96

% Moisture: not dec. _____ dec. _____

Date Extracted: 11/30/96

Extraction: (SepF/Cont/Sonc) CONT

Date Analyzed: 12/05/96

GPC Cleanup: (Y/N) N pH: 7.0

Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
---------	----------	--	---

62-75-9-----N-Nitrosodimethylamine_____	100	U
108-95-2-----Phenol_____	100	U
111-44-4-----bis(2-Chloroethyl) ether_____	100	U
95-57-8-----2-Chlorophenol_____	100	U
541-73-1-----1,3-Dichlorobenzene_____	100	U
106-46-7-----1,4-Dichlorobenzene_____	100	U
95-50-1-----1,2-Dichlorobenzene_____	100	U
108-60-1-----2,2'-Oxybis(1-chloroprop (1)_____	100	U
621-64-7-----N-Nitroso-di-n-propylamine_____	100	U
67-72-1-----Hexachloroethane_____	100	U
98-95-3-----Nitrobenzene_____	100	U
78-59-1-----Isophorone_____	100	U
88-75-5-----2-Nitrophenol_____	100	U
105-67-9-----2,4-Dimethylphenol_____	100	U
111-91-1-----bis(2-Chloroethoxy) methane_____	100	U
120-83-2-----2,4-Dichlorophenol_____	100	U
120-82-1-----1,2,4-Trichlorobenzene_____	100	U
91-20-3-----Naphthalene_____	55	J
87-68-3-----Hexachlorobutadiene_____	100	U
59-50-7-----4-Chloro-3-methylphenol_____	100	U
88-06-2-----2,4,6-Trichlorophenol_____	100	U
91-58-7-----2-Chloronaphthalene_____	100	U
131-11-3-----Dimethylphthalate_____	100	U
606-20-2-----2,6-Dinitrotoluene_____	100	U
208-96-8-----Acenaphthylene_____	100	U
83-32-9-----Acenaphthene_____	53	J
51-28-5-----2,4-Dinitrophenol_____	500	U
100-02-7-----4-Nitrophenol_____	500	U
121-14-2-----2,4-Dinitrotoluene_____	100	U
84-66-2-----Diethylphthalate_____	100	U
86-73-7-----Fluorene_____	81	J
7005-72-3-----4-Chlorophenyl-phenylether_____	100	U

(1) 2,2'-oxybis(1-Chloropropane) is known as bis(2-Chloroisopropyl) ether

FORM I SV-1

SW846

000186